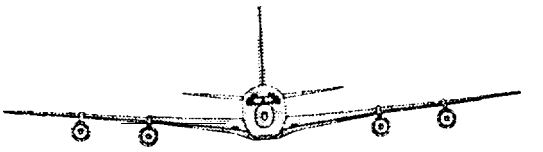
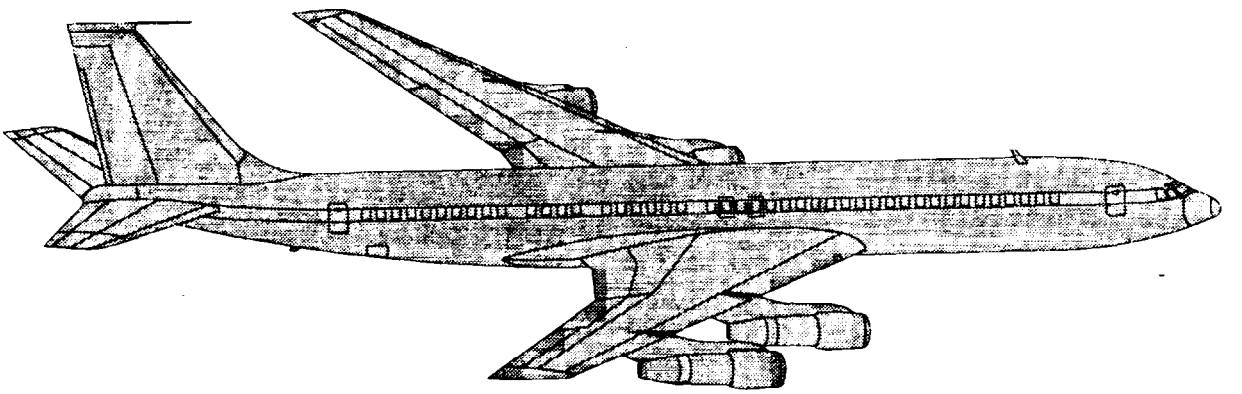
U.S. Department
of Transportation





LAVATORY ACCESSIBILITY IN SINGLE-AISLE AIRCRAFT

FINAL REPORT OF THE AIRCRAFT ACCESSIBILITY FEDERAL ADVISORY COMMITTEE

Office of Environment, Energy, and Safety
Office of the Secretary of Transportation

TABLE OF CONTENTS

INTRODUCTION

The Department of Transportation (DOT) issued an Advance Notice of Proposed Rulemaking (ANPRM), notice 90-10 published in the *Federal Register* on March 6, 1990. The notice (attached in Appendix D) posed nine questions designed to solicit public comments concerning the feasibility of providing accessible lavatories in single-aisle aircraft with 200 passenger seats or fewer. Current regulations apply only to new production deliveries or refurbishment of twin-aisle aircraft.

Few comments were received on the ANPRM. Consequently, DOT established the Aircraft Accessibility Federal Advisory Committee. The purpose of the Committee was to provide guidance to DOT concerning access to lavatories on single-aisle aircraft for persons with disabilities, including persons who use wheelchairs. Accordingly, Committee members representing airlines, airframe manufacturers, disability advocacy groups, professional organizations, aviation safety organizations and relevant Federal agencies were appointed (A list of Committee members and other participants is provided at Appendix C.) The Committee held its first meeting July 29-30, 1992. Additional meetings were held September 16-17, December 9-10, and March 31-April 1, 1993.

The Committee visited aircraft, reviewed aircraft configuration studies, discussed policy issues, and reviewed a report defining "Functional Categories of Persons with Disabilities and Operational Dimensions for Designing Accessible Aircraft Lavatories."[1] Discussions on spatial and physical needs were described by Committee members with disabilities, including the importance of related assistive equipment, sinks, and other common amenities in the accessible lavatory.

Contained herein are the comments, findings, and advice of the Committee members concerning further rulemaking to implement the Air Carrier Access Act of 1986 with respect to accessible lavatories on single-aisle aircraft.

[1] "Functional Categories of Persons with Disabilities and Operational Dimensions for Designing Accessible Aircraft Lavatories" is the title of a document prepared by C. Gerald Warren and Teresa Valois for the Paralyzed Veterans of America, National Easter Seal Society, National Multiple Sclerosis Society, and the United-Cerebral Palsy Associations, Inc.

DEFINITION OF- TERMS'

A. Assistive Equipment - Physical features that are used by passengers with disabilities, including visual and hearing impairments, e.g., hand bars, hand grips, platforms, signage, and lighting to facilitate their use of the lavatory. Platforms are horizontal projections (frequently molded in) from a nearby wall that may be used for support in the manner of hand grips or hand rests.

B. Call Button - The control switch in the lavatory used to illuminate the flight attendant call light.

C. Call Light - A readily visible light outside of the lavatory enclosure that can be illuminated by the use of the call button in the lavatory to advise a flight attendant to assist a passenger.

D. Lavatory - A facility customarily used by passengers for their hygienic functions and appearance needs.

E. Lavatory Enclosure - An auxiliary area contiguous to a lavatory that can be separated from the passenger cabin so as to provide an extended area for privacy and maneuverability for passengers with disabilities.

F. Sink and Amenities - The sink (or wash basin) along with a drain control and a faucet assembly to provide hot or cold water for washing needs. Amenities typically include toilet paper, soap, paper towels, and a vanity mirror.

G. Toilet Flush Control - A switch that initiates the toilet flushing cycle.

H. Transfer - The physical movement of a passenger between a passenger. seat, an on-board wheelchair, and/or a lavatory toilet seat. Some-passengers can-perform an *independent transfer* using appropriate handrails, platforms, etc. 'Others need physical 'assistance from another person to perform a *dependent transfer.* For passengers in the latter category, a variety of techniques may be used to lift the passengers clear off one seat, move them until they are over the other seat, and then lower the passengers into a seated position. A passenger's angular change of position is expressed in terms of "degrees of transfer," e.g., in a 90 degree transfer, a passenger is pivoted through a 90 degree arc. In a zero degree or lateral transfer, a passenger transfers laterally from seat to seat. It must be noted that there is a wide variety of transfer techniques and toileting methods, each with its own spatial requirements. The space required for a 90 degree transfer of a 97.5 percent male with a personal attendant

who is also a 97.5 percent male should accommodate the needs of most other passengers with disabilities who use transfer techniques different from those described herein, whose method of using the toilet may not require transfer, or who use mobility aids.

I. Signage - An accessible lavatory provides signage for individuals with visual impairments or who are blind.

J. Warnings - Visual and audible warnings, are needed so that individuals with visual. or hearing disabilities may be instructed to leave the lavatory when necessary.

HUMAN AND ENVIRONMENTAL FACTORS

A. Physical Characteristics of Users - Accessible lavatories, while modified for the needs of passengers with disabilities, can be used by all passengers. The underlying presumption is that the purpose of the design is to make the lavatory accessible to and usable by adult passengers who must be transported in an on-board wheelchair to reach the lavatory.

B. Aircraft Operating Environment - Consistent with 14 CFR Part 382.39, a flight attendant will assist the passenger in khe use of an on-board wheelchair, and operation of the lavatory/enclosure, but not passenger lifting within the lavatory or personal hygienic needs.

RESPONSE TO ANPRM

The Committee accepts as a basic principle that people with disabilities are entitled to levels of privacy, dignity, and independence equivalent to those afforded all passengers of commercial aircraft. The Air Carrier Access Act prohibits air carriers from discriminating on the basis of disability, and these factors are critical to meaningful implementation of the Act:

While the Committee's charter was to provide guidance concerning lavatory access on single-aisle aircraft with fewer than 200 passenger seats, further direction by DOT, as well as the background of the Committee's membership limited the scope of the study to single-aisle aircraft with 100 or more passenger seats. Given that direction, the work of the Committee focused on a series of airframe manufacturer design studies which were based on the "Suggested Guidelines for Accessible Lavatories in Twin

Aisle Aircraft."[2] It was recognized that significant differences exist in the space available on single aisle aircraft versus that available on twin-aisle aircraft. However, it was determined that it is possible to design lavatories for single-aisle aircraft with 100 or more seats which will accommodate persons with disabilities, including people who use wheelchairs and require a 90 degree dependent transfer.[3]

The Committee's review also revealed that the easiest and least expensive solutions tended to have the greatest impact on cabin service and passenger flow, as well as limiting the accessibility provided to the lavatory. (Reference Design Concepts C and D, Appendix A). Solutions requiring extensive aircraft redesign tended to be more expensive in terms, of both revenue loss and manufacturing costs but provided for little to no disruption to passengers, cabin service, and other crew duties. (Reference Design Concepts A and B, Appendix A). These solutions also tended to provide the highest degree of accessibility.

Following is a discussion of the nine issues on which DOT requested advice and the Committee's response to those issues, explaining the foregoing statements in more detail.

Advice on:

1. The degree to which it is possible to design for placement in a narrow-body aircraft a lavatory that will accommodate persons with disabilities, including those who use wheelchairs.

2. For the various cabin configurations of different aircraft types with. fewer than 200 seats, what physical layouts are possible to offer passengers at least visual privacy and the ability to maneuver in the lavatories?

[2]"Suggested Guidelines for Accessible Lavatories in Twin-Aisle Aircraft" is the title of a document prepared by an ad hoc working group comprised of representatives from airframe manufacturers airlines, disability advocacy groups, and Federal agencies. The Air Transport Association of America. maintains administrative control of the document.

[3]Fokker Aircraft representatives noted that dependent transfers are not possible in all cases due to space limitations in existing lavatory locations on some models of aircraft.

Comments:

Drawing on the data in the "Suggested Design Guidelines for Accessible Lavatories in Twin-Aisle Aircraft" the Committee requested airframe manufacturers to provide layouts for a series of possible designs for different aircraft models with seating capacity of 100 to 199 seats. (Ref: Appendix A). The Committee reviewed those extensively at the September 16-17,1992 meeting of the Advisory Committee. Rather than reviewing detailed lavatory designs, the Committee focused on the issue of floor space to ascertain if accessibility were feasible.: The following findings presume the use of a compatible on-board wheelchair.

a. Some aircraft types have structural elements which intrude into the cabin, such as the MD80 and Fokker 100 engine bulkhead mounts, and/or equipment placements which will limit enlargement of lavatories in existing locations.

b. On smaller aircraft, design, weight and balance considerations may constrain space availability and location, thus limiting the degree. of accessibility.

c. Current lavatory configurations exist on all aircraft types which, with minor privacy improvements, would provide 180 degree independent transfer capability. (Ref. Design Concept D, Appendix A).

d. Lavatories can be made more accessible by utilizing enclosures, which incorporate entry door space, aisle space, and galley work space, to create the accessible lavatory. In such cases, the wheelchair within the enclosure will project outside the lavatory door for approximately one-half of its overall dimension. In some cases, the wheelchair will project into enclosed aisle space or areas near exit doors.

e. Configurations using lavatory enclosures which fully contain the wheelchair may provide equivalent privacy. Certain types of enclosures do not provide such level of privacy. Another option would be to widen lavatory door openings and use the larger door to form one portion of a privacy barrier. This might be done in conjunction with some type of flexible barrier. In some aircraft, improvements in providing these types of privacy areas can be enhanced by relocating the lavatory door opening to another side of the module; thus changing the area to be used from an aisle to a doorway area.

f. The space required to accomplish accessibility may vary from that provided by the "Twin Aisle Guidelines." Such variations may be possible with appropriate placement of walls, counter tops, and assistive devices to facilitate the transfer process. Variations can be verified by equivalent facilitation.

Advice on:,

3. What physical layouts are possible which would provide disabled passengers using an on-board wheelchair full maneuvering room inside the lavatory? What layouts would provide partial accessibility (e.g., a privacy curtain)?

4. Which designs can be.accomplished without the loss'of revenue seats?' Which designs can. be accomplished with'only minimal loss of revenue seats?'

Comments:

Some accessible lavatory configurations can be accomplished without the loss of passenger seats. However, achieving full accessibility without passenger seat loss more often than not will cause loss of other amenities such as galleys and closets. A reduction in passenger seat pitch could also result in yielding less leg room in coach compartment. Such features represent marketing advantages to air carriers and their loss can also translate into lost revenue, although a much less tangible and quantifiable loss than that due to seat removal.

The more permanent the enclosure, the greater the seat or space loss. Designs which use temporary lavatory enclosures can usually be accomplished without the loss of seats. Designs which do not use temporary lavatory enclosures will cause a loss of passenger seats or other amenities unless a limited transfer capability is acceptable. Minimizing the loss of seats in the latter case will depend on the type of aircraft and available locations for lavatories.

The following accessible lavatory design concepts were developed as described in'the comments to questions 1 and 2 and address the potential impact to lavatory maneuvering room and revenue loss -with all aircraft models equipped with 100 to 199 seats: (Ref. Appendix A.) The conceptual diagrams depicted in Appendix A illustrate various.possible means to accommodate wheelchair accessible lavatories within different aircraft configurations. Spatial configuration was the primary consideration for these designs; other factors such as flight attendant access to the cabin jumpseats, emergency equipment (i.e., fire extinguishers, first aid and emergency oxygen), and communication systems were not specifically considered. In some designs, access between the

cockpit and the main cabin is restricted when the accessible lavatories are in use for short periods of time during the cruise phase of the flight. Therefore, no inferences should be made regarding the ultimate practicality of some of these diagrams. However, discussions during the meeting produced a clear understanding that a complete aircraft design process can and does account for all of these systems as required by applicable FAR Parts 25 and 121.

Design Concept A. Comprises an enlarged, fully-contained lavatory which allows full accessibility" including-go-degree dependent 'and independent.. transfers from an on-board wheelchair. 'This design concept may result in the loss of 2 first-class or 3 tourist-class passenger seats or 1 significant closet/galley unit." No commercially available aircraft lavatory configurations meet the spatial requirements of this concept, although some conceptual designs do.

Design Concept B. Comprises an enlarged lavatory with enclosure which allows full accessibility including. 90-degree dependent and independent transfers from an on-board wheelchair. This design concept may result in the loss of 3 tourist class passenger seats or a minor reduction in closet/galley space.'.No commercially available aircraft lavatory configurations meet the spatial requirements of this concept. Some proposed designs would meet this requirement.

'Diagram in Appendix A incorporating Design Concept A show the potential loss of 3 tourist class passenger seats. However, since these are conceptual designs only, during discussions on March 31 and April 1, 1993, some Committee members suggested that the actual designs might result in the loss of 5 seats.

'Diagram in Appendix A incorporating Design Concept B does not show the potential loss of 3 tourist class passenger seats, however dialogue during meeting of March 31 and April 1, 1993, indicates that depending upon the location of the toilet, there may be a loss of 3 tourist class passenger seats.

Design Concept C. -Comprises a slightly enlarged lavatory with an adjacent enclosure which limits access to no greater than a 90-degree independent 'transfer from an on-board wheelchair. This design concept assumes no loss of passenger seats or closet/galley space. Several existing aircraft lavatory configurations, with minor modification, can meet the spatial requirements of this concept. This concept accommodates fewer persons with disabilities, than A or B above.

Design Concept D. Comprises ah existing standard size lavatory with an enclosure which limits access to 180-degree independent transfer from the on-board wheelchair. This configuration will generally prohibit access to wheelchair users who cannot stand. This design concept will not result in the loss of any passenger seats or closet/galley space. Most existing aircraft lavatory configurations, where modified to include the enclosure, can meet the spatial requirements of this concept. This concept accommodates fewer persons with disabilities than A, B, or C above. Some members of the Committee who represent persons with disabilities do not consider that concepts C and D meet the requirements of an accessible lavatory.

Advice on:

5. How would such arrangements affect passenger traffic within the cabin, flight attendant duties in the galleys., and the passenger ease of access to the remaining lavatories?

Comments.;.

Configurations which use a self-contained lavatory do not by their very nature affect traffic in the cabin or crew activities except for normal use of this space for lavatory queuing and entrance, depending on their positioning.

Configurations involving lavatory enclosures may occupy galley space and/or cabin aisle space when in use. These configurations may affect normal passenger movement, crew activities, and cabin service. Additionally, the aisle between two opposing lavatories may be used to create adequate enclosed space for an accessible lavatory, thus eliminating use of the other lavatory by other passengers.

Advice on:

6. How might such arrangements impair safety, if-at all?

Comments:

The Committee determined in some of the proposed configurations that it is possible to achieve accessibility without impairing safety. Safety is an overriding and non-negotiable requirement which must comply with 14 CFR Parts 25 and 121.

Advice on:

7. In small planes, where can the on-board wheelchair be stored?

Comments:

Different styles of on-board wheelchairs require different amounts of space. Most airlines have selected one chair which best matches their current fleet configurations. While not currently a requirement to carry the wheelchairs on board single aisle aircraft unless requested by a passenger, most carriers have elected to permanently carry them on aircraft with 100 or more seats. Most current aircraft configurations provide for space in a closet or floor-mounted bin. Space also exists in some configurations in overhead bins and under seats. Should these areas be removed or reduced in size to accommodate an accessible lavatory, available on-board stowage space may become an issue.

Advice on:

8. Down to what size airplanes and for what types can accessible lavatory requirements reasonably be imposed?

Comments:

Per DOT instruction: this Committee considered aircraft with 100 seats or more based on the certified maximum capacity rather than operator-specific configurations. We received information on aircraft with fewer than 60 seats, but very little on aircraft with 60-99 seats. Much of the material in this report may be applicable to aircraft with fewer 100 seats and the Committee suggests that DOT investigate the application of the report to aircraft with fewer than 100 seats.

Advice on:

9. Should any requirements for accessible lavatories be made a function of stage length instead of airplane size, and if so for what stage lengths should such requirements be imposed? How would this approach alter air carriers' operational flexibility?

Comments:

Members of the Committee agreed that aircraft size was the better parameter since airlines use the same aircraft for a variety of stage lengths. Operational flexibility would be greatly impaired by using a stage length criterion.

Additional Comments:

1. Installation of an accessible lavatory can be achieved on both type certificated aircraft (aircraft in production) and new type design aircraft.

   New type design aircraft, which are aircraft designs not yet certified by FAA, allow for a "ground up" systems approach that integrates the lavatory as part of the original aircraft layout. A new type design enables engineers to maximize the interior cabin space at a lower overall cost to the operator.

   Type certificated aircraft, which are already in production, may require extensive and costly design modifications to install an accessible lavatory. Production aircraft will require engineering feasibility studies to determine the structural and system modifications needed for installation of a new lavatory. In some cases, installation of an accessible lavatory may adversely affect the aircraft's flight characteristics as well as operational and safety procedures. Accordingly, design, operational, and safety-assessments must be considered:, However, the existing types of aircraft designs may be able to'be optimized by using current lavatory locations and the use of existing space and moveable lavatory enclosures to provide an accessible lavatory that affords equivalent privacy. Current production aircraft design modifications must be certified by FAA and require approximately two years' lead time before the first aircraft is delivered to an air carrier.

   The costs associated with the installation of accessible lavatories vary by aircraft type,.size, and the degree of accessibility provided.

Each design concept discussed below has different space requirements. In some cases, the design may lead to loss of seats which can be quantified. In other cases, the accessible lavatory can be accommodated by removing or decreasing the size of a storage unit or closet. This will have some effect on service but is non-quantifiable. Cost data were provided by air carrier representatives and airframe manufacturers. The estimates are based on the assumption of a 100 aircraft order.

Design Concept A . fully contained lavatory allowing 90 degree. dependent and independent transfer from anon-board wheelchair

- Cost per aircraft = $150,000
- Possible loss of 2 F/C passenger or 3 T/C passenger seats ($300,000) revenue loss per aircraft or loss of one significant closet/galley unit (non-quantifiable)

Design Concept B: lavatory using lavatory enclosure allowing 90-degree dependent and independent transfer from an on-board wheelchair.

- Cost per aircraft = $170,000
- Possible loss of 3 T/C passenger seats ($300,000) revenue loss per aircraft or loss of minor closet/galley space (don-quantifiable)

Design Concept C: lavatory using a lavatory enclosure allowing only 90-degree independent transfer from an on-board.wheelchair.

- Cost per aircraft = $140,000
- No seat or space loss (no revenue loss per aircraft)

Design Concept D: lavatory using lavatory enclosure allowing only 180-degree independent transfer from an on-board wheelchair

- C&t per aircraft = $20,000
- No seat or space loss (no revenue loss per aircraft)

2. The Accessibility of a lavatory involves more than the dimensions of the module itself. Use of the space is contingent upon the design of the on-board wheelchair. The degree of accessibility also depends upon the design and placement of grab bars, call buttons, call lights, signage, warnings, common lavatory amenities, 'sinks, and flush controls contained within the lavatory.

Departures from particular design concepts are permitted where the alternate means provide substantially equivalent or greater access to, and usability of, lavatories or lavatory enclosures. Such alternative means are to permit individuals with disabilities to approach, enter, and use a lavatory as easily, safely, conveniently, and independently as the means described above would permit.

Carriers can provide accessibility'by demonstrating that an alternative method will result in equivalent facilitation. This demonstration is to involve a statistically valid sample of individuals with disabilities and demonstrate independent and assisted use of the lavatory: The demonstration is-to be conducted by people trained in research techniques who are familiar with the physical requirements of people with disabilities, including methods of transfer, toileting, and use of mobility aids.

Any alternative method should be validated by a demonstration that provides accessibility. The methodology used in the demonstration should be developed in consultation with individuals with training in research techniques who are familiar with the physical requirements of persons with disabilities, including methods of transfer, toileting, and use of mobility aids.

3. Effective Date of Final Rule

The Committee agreed that the requirements for accessibility should reflect those that currently apply to aircraft with more than one aisle. In particular, that new aircraft ordered by a carrier after the effective date of the rule or delivered more than 2 years after the effective date-shall comply

Findings

The Committee believes that Design Concept A or B is feasible except in one model of one manufacturer's aircraft. Design Concept B would permit only independent transfer in that model of aircraft. A different design of-on-board chair might permit aircraft accessibility in that aircraft as currently designed. Some members of the Committee do not consider that concepts C and D meet the requirements of an accessible lavatory.

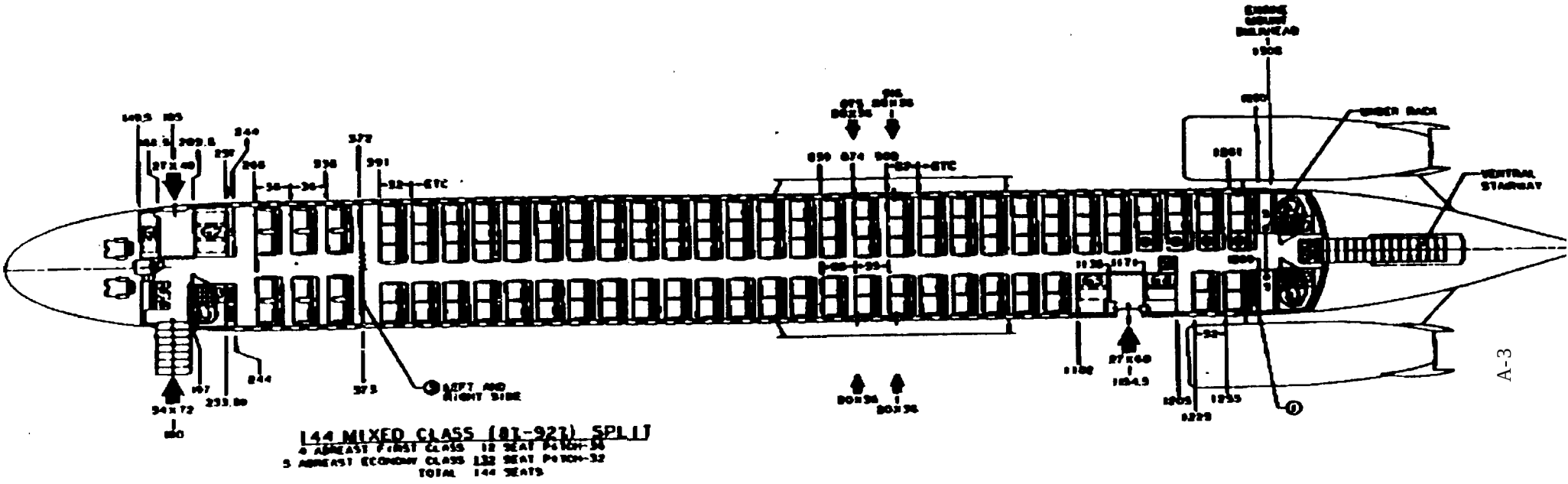
APPENDIX A

DESIGN CONCEPTS
ACCESSIBLE LAVATORIES
FOR
SINGLE AISLE AIRCRAFT
(MD-80)

Prepared by: DEAN KLIPPER
MD80/90 Interior
Certification/Cabin Safety
Douglas Aircraft Company
Phone: 310/593-0825
Fax: 310/496-6628

September 14th, 1992

TABLE OF CONTENTS



BASELINE CABIN CONFIGURATION

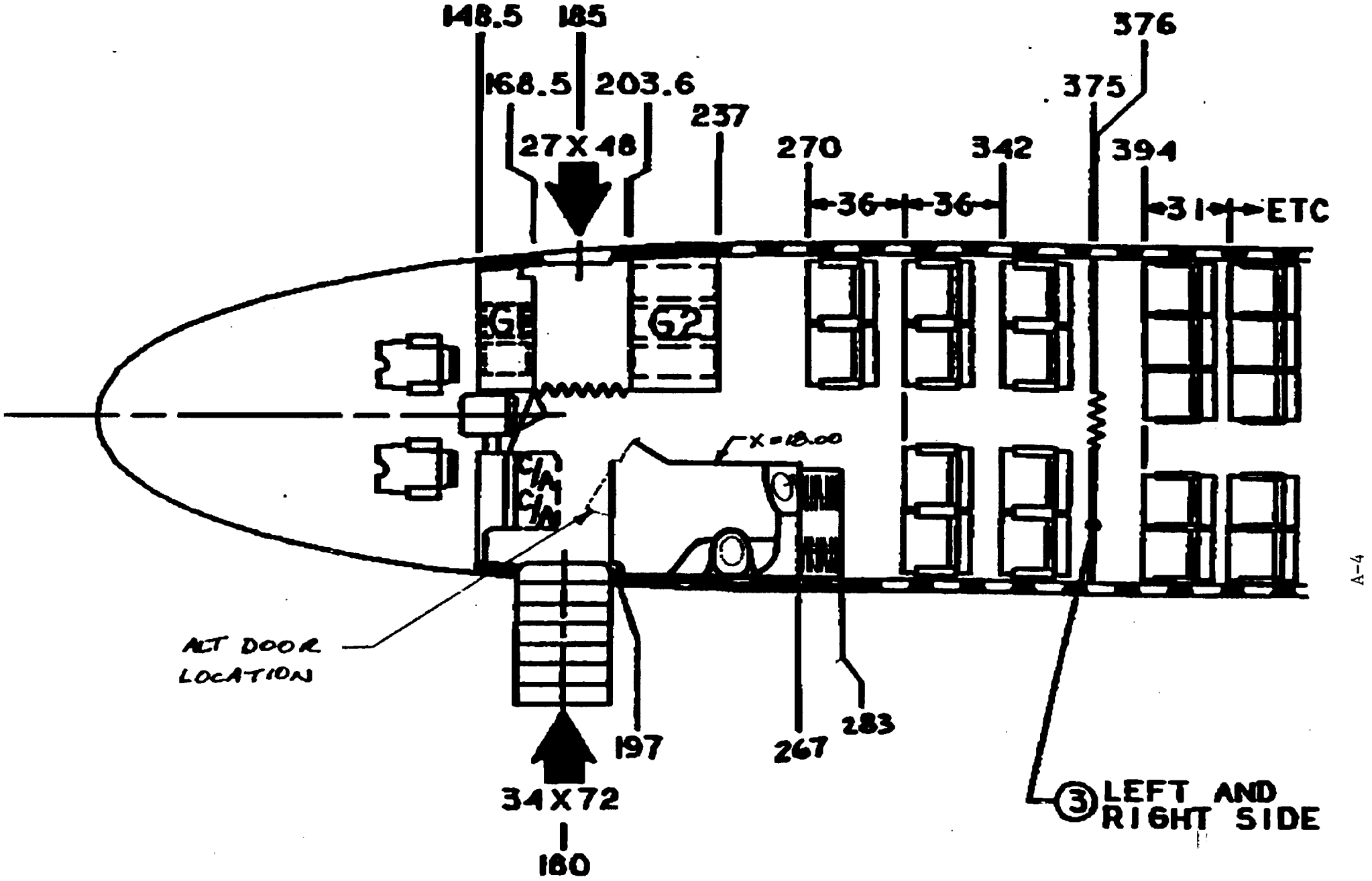
McDONNELL DOUGLAS MODEL MD-80

DAC

MD-80

PROPOSED INTERIOR
144 MIXED (12/132)

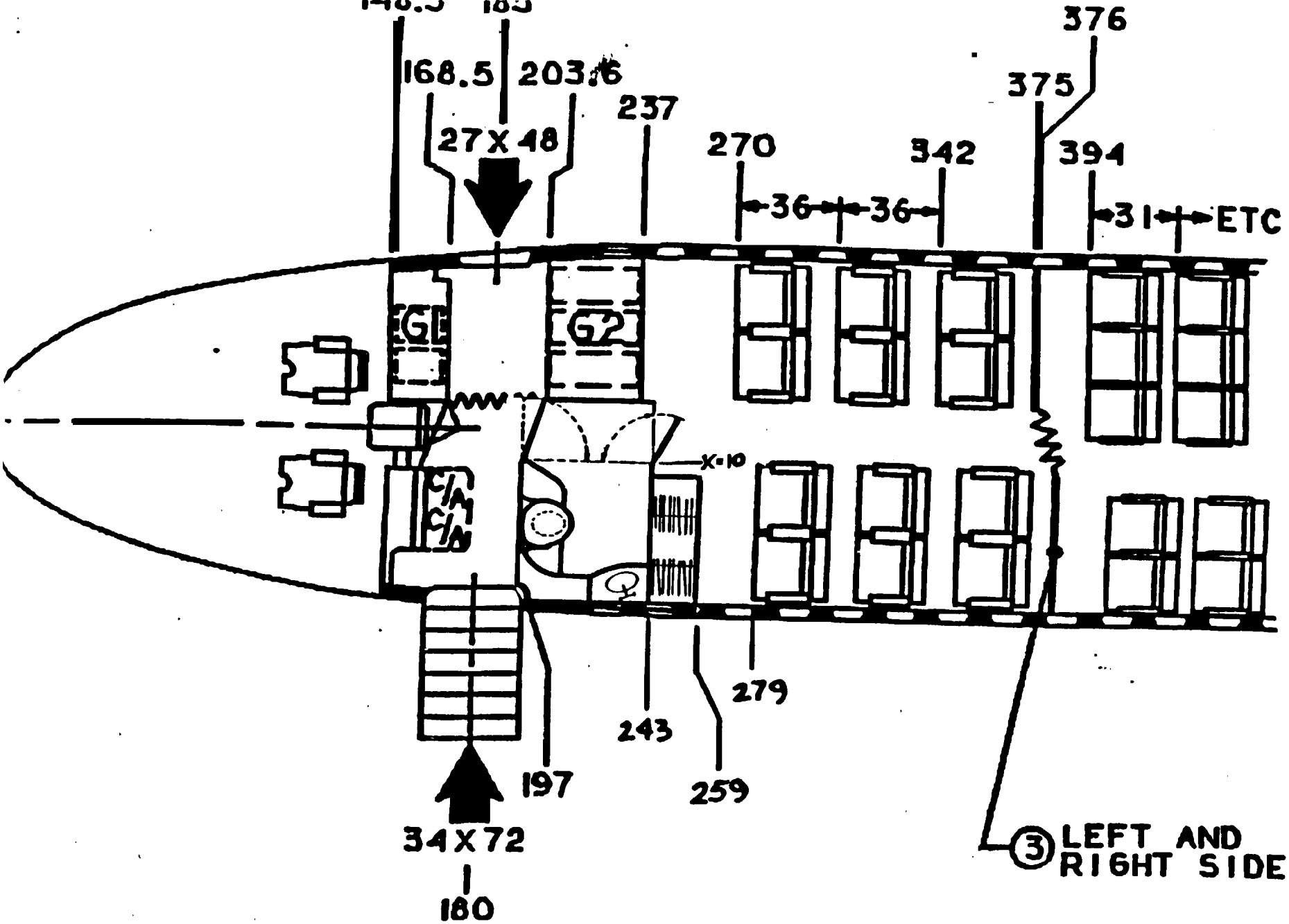
165 | J055344



A-4

DESIGN CONCEPT-A

FULL DEPENDENT TRANSFER WITHIN LAV
SCALE- 1/50

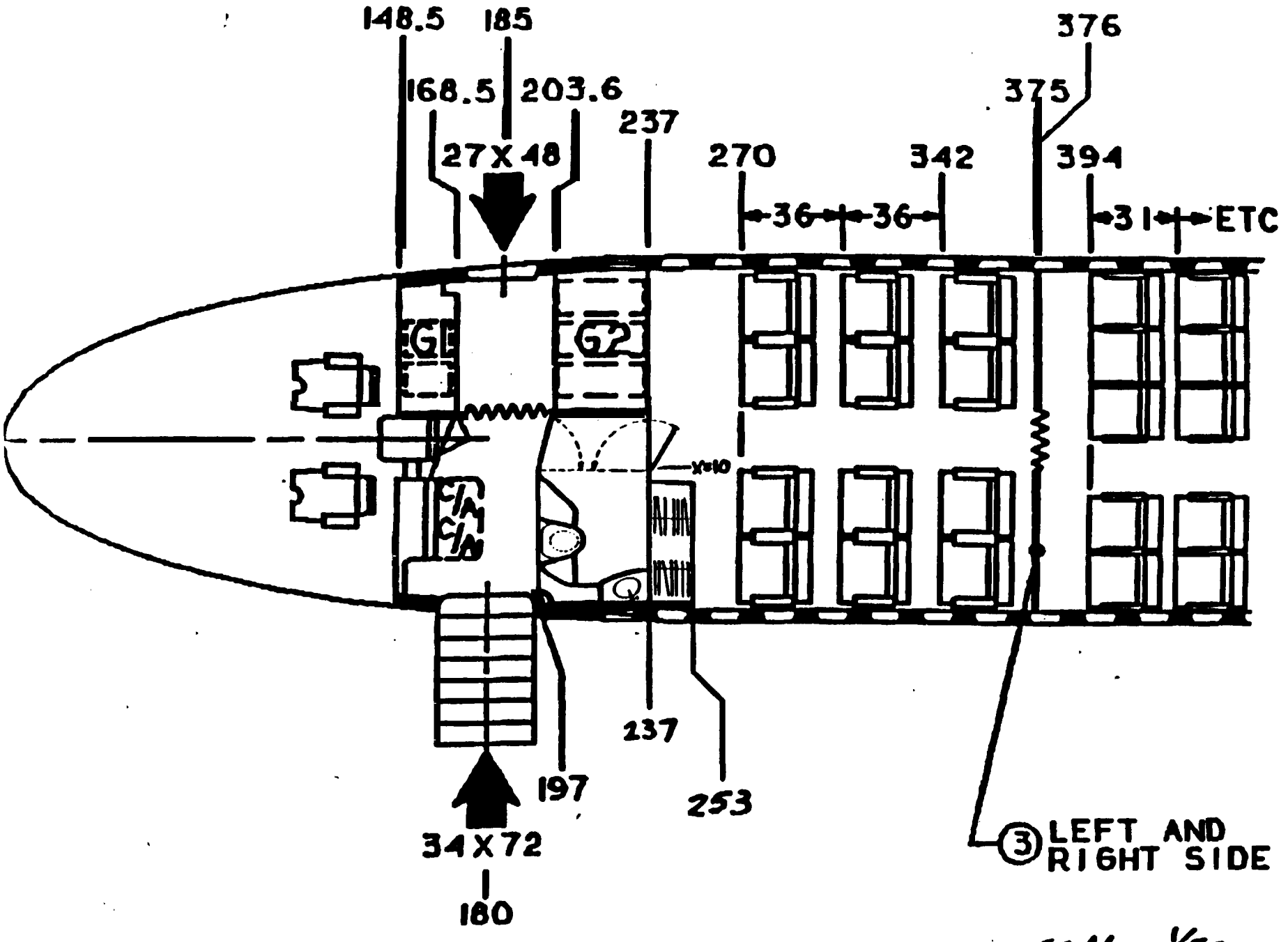


DESIGN CONCEPT-B

MC DONNELL DOUGLAS

FULL DEPENDENT TRANS WITH TEMPORARY ENCL.

SCALE 1/50

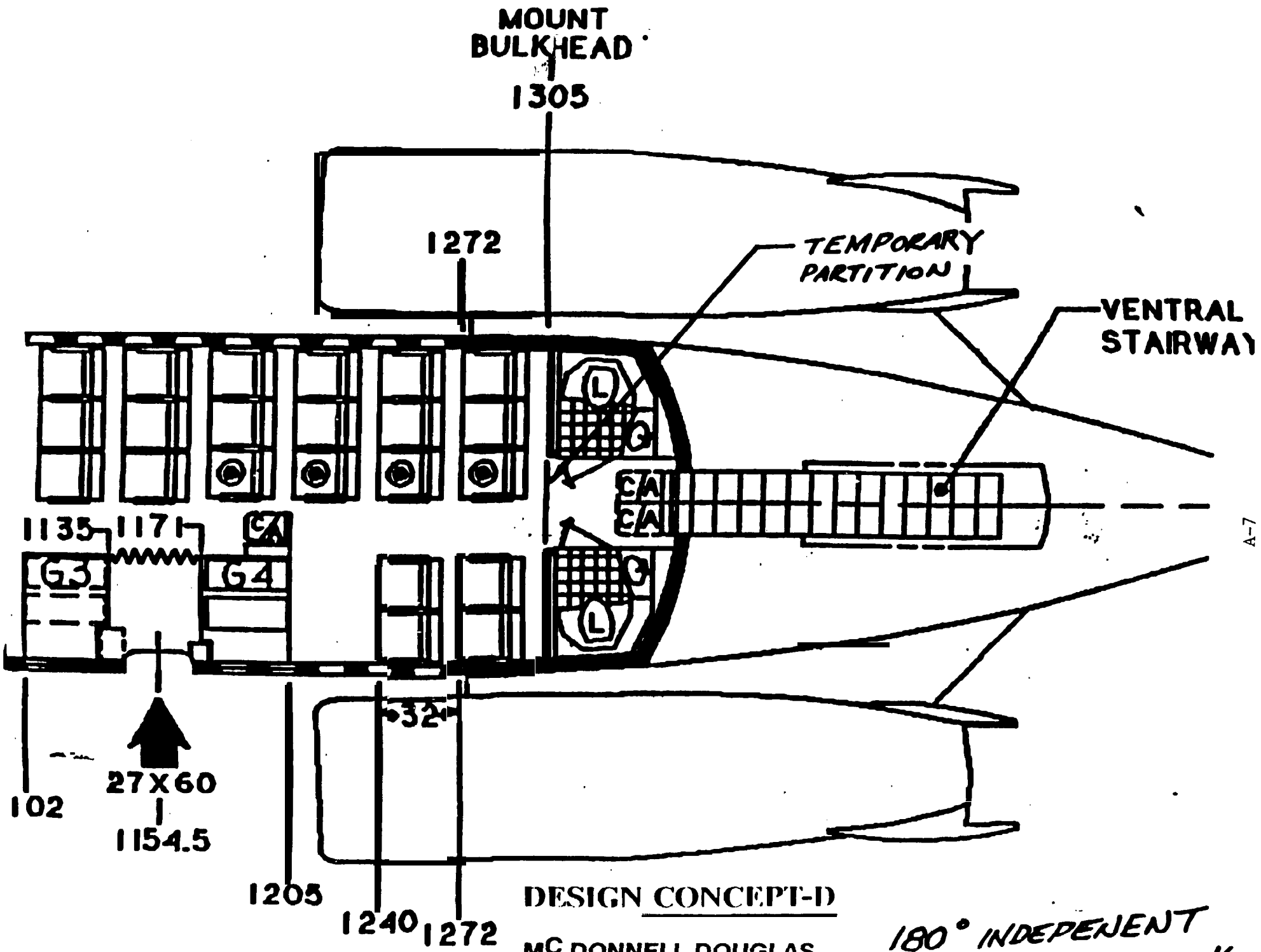


DESIGN CONCEPT-C

MC DONNELL DOUGLAS

SCAL - 1/50

90° INDEPENDENT TRANSFE WITH TEMPORARY ENCL.

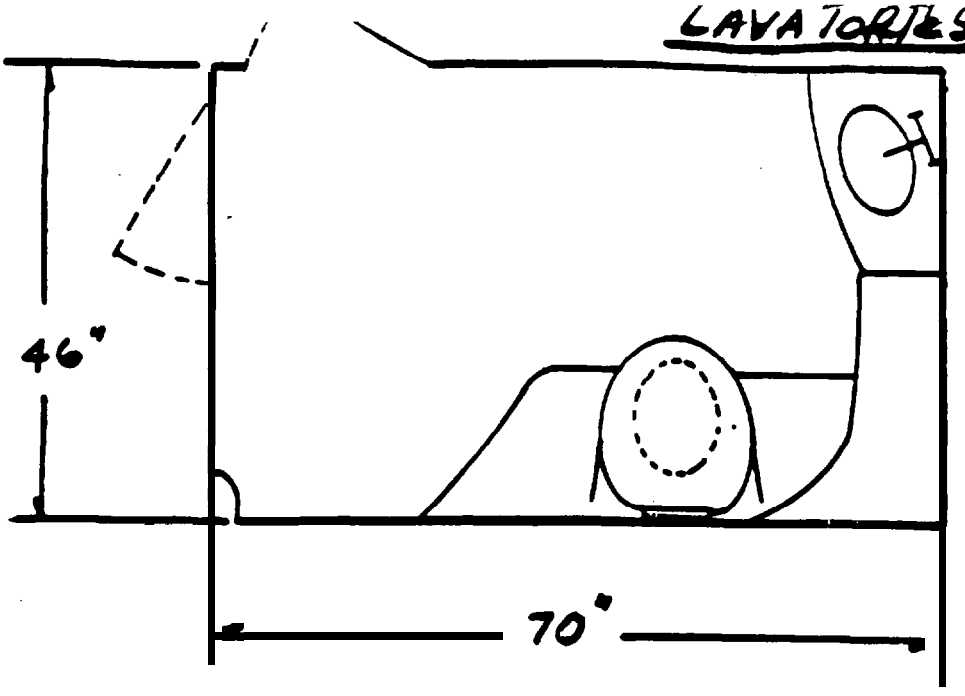


DESIGN CONCEPT-D

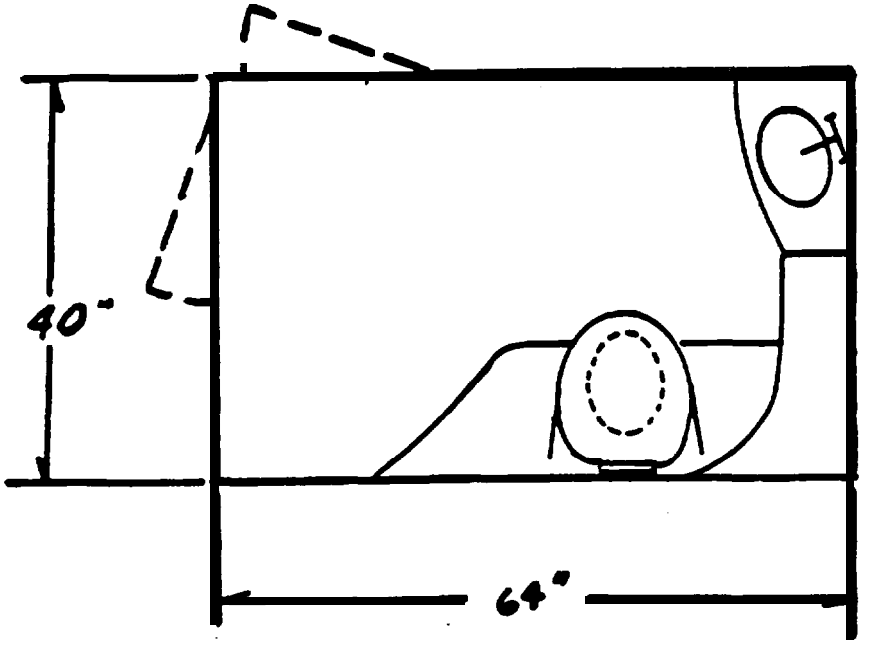
MC DONNELL DOUGLAS

180° INDEPENENT TRANSFER SCALE-1/50

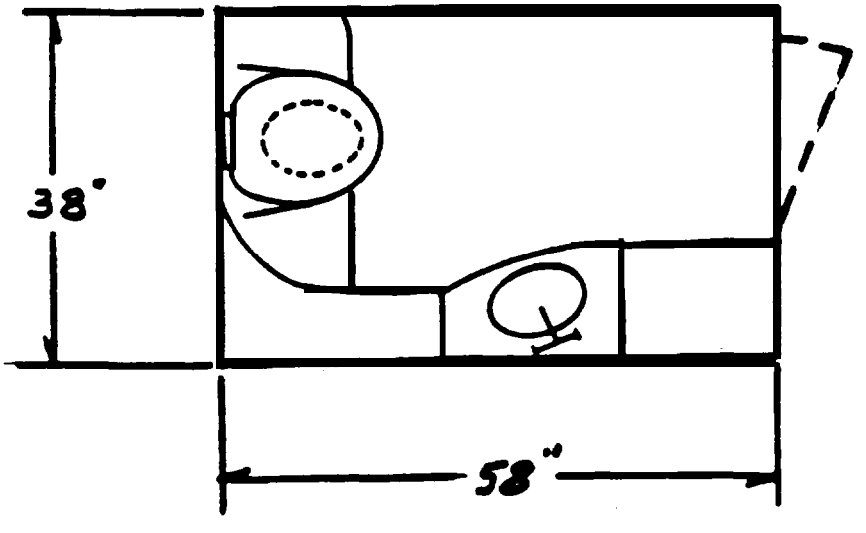
LAVATORIES



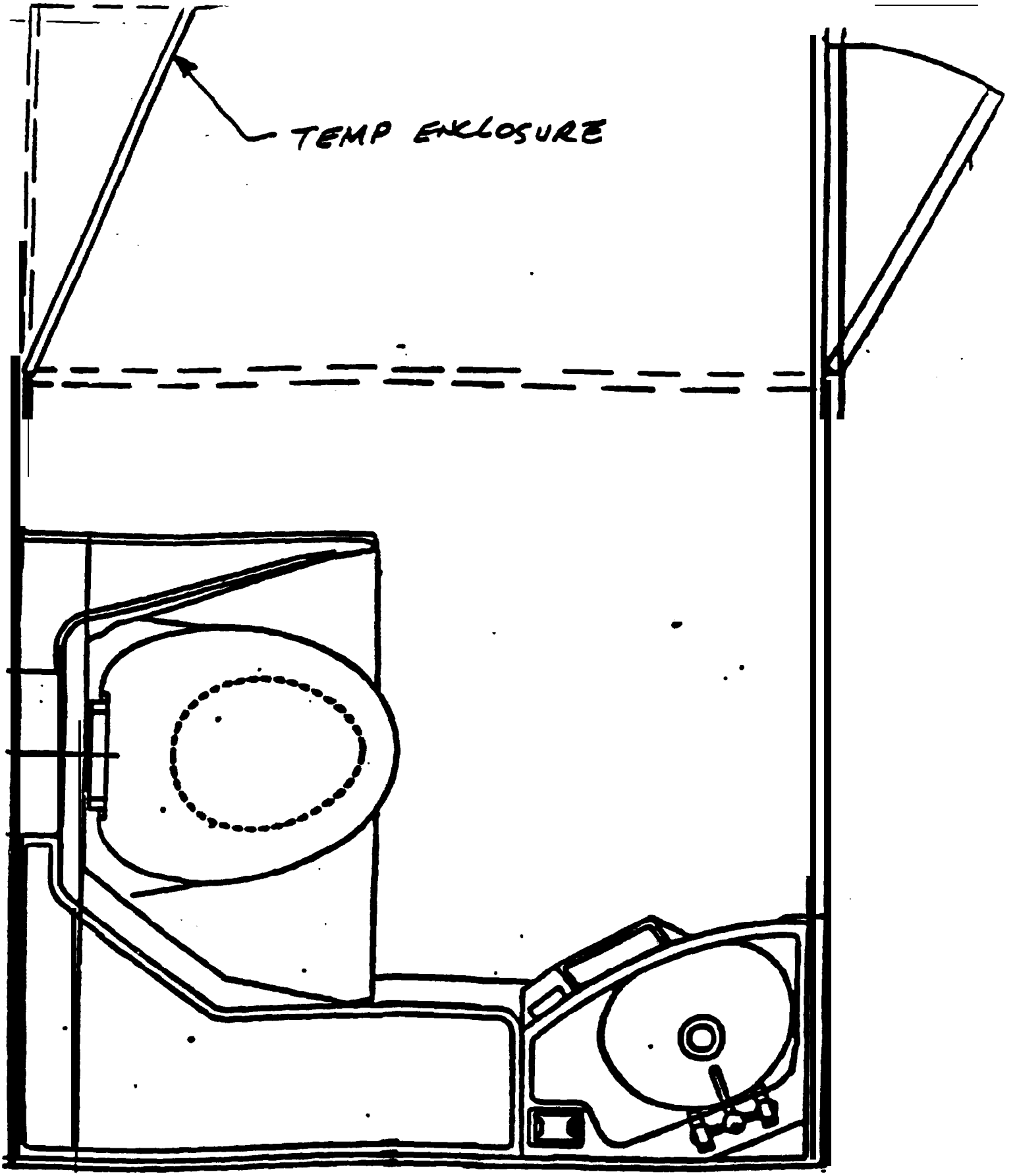
DEPENDENT TRANSFER



90° INDEPENDENT TRANSFER



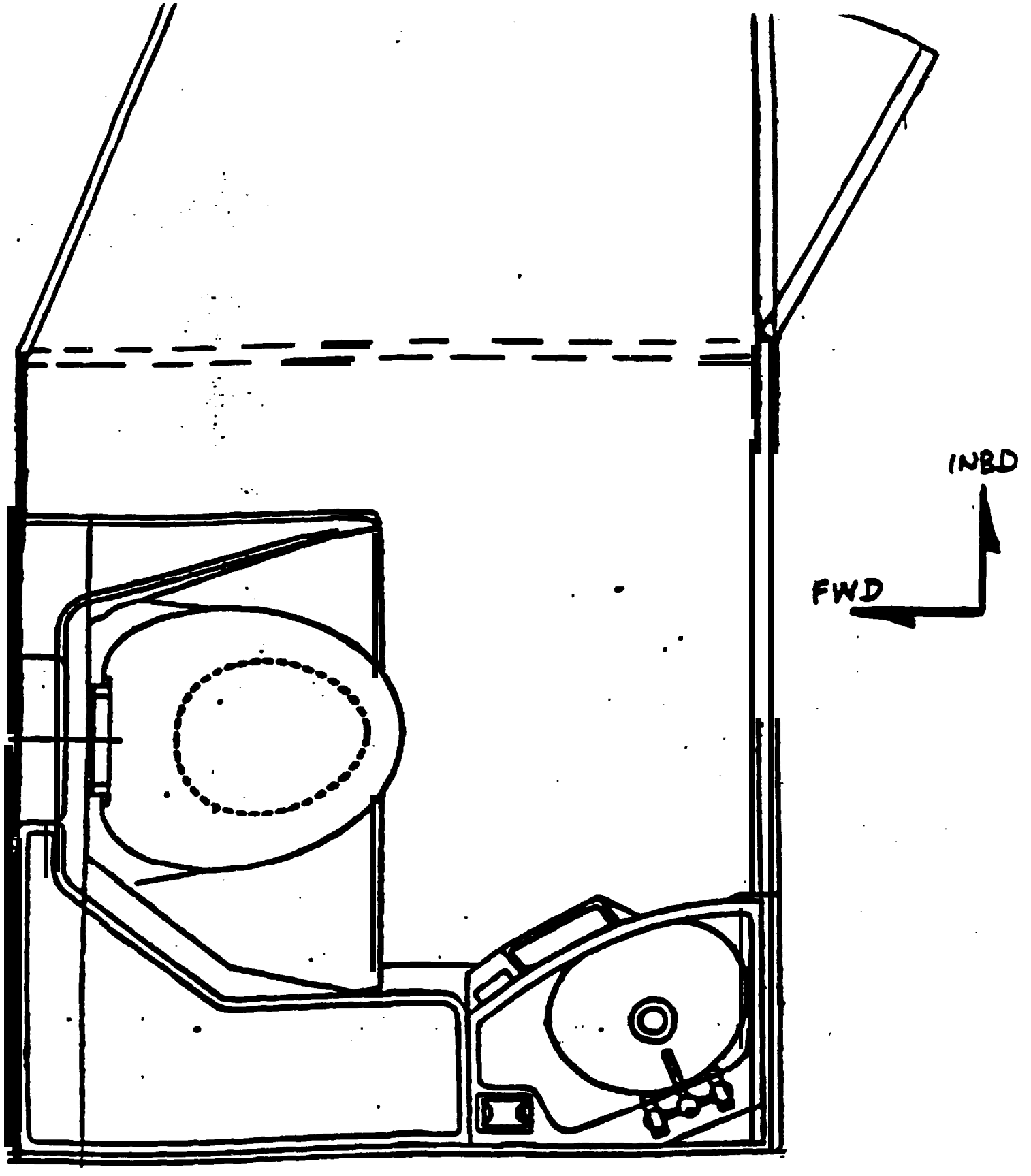
180° INDEPENDENT TRANSFER



SCALE - 1/8

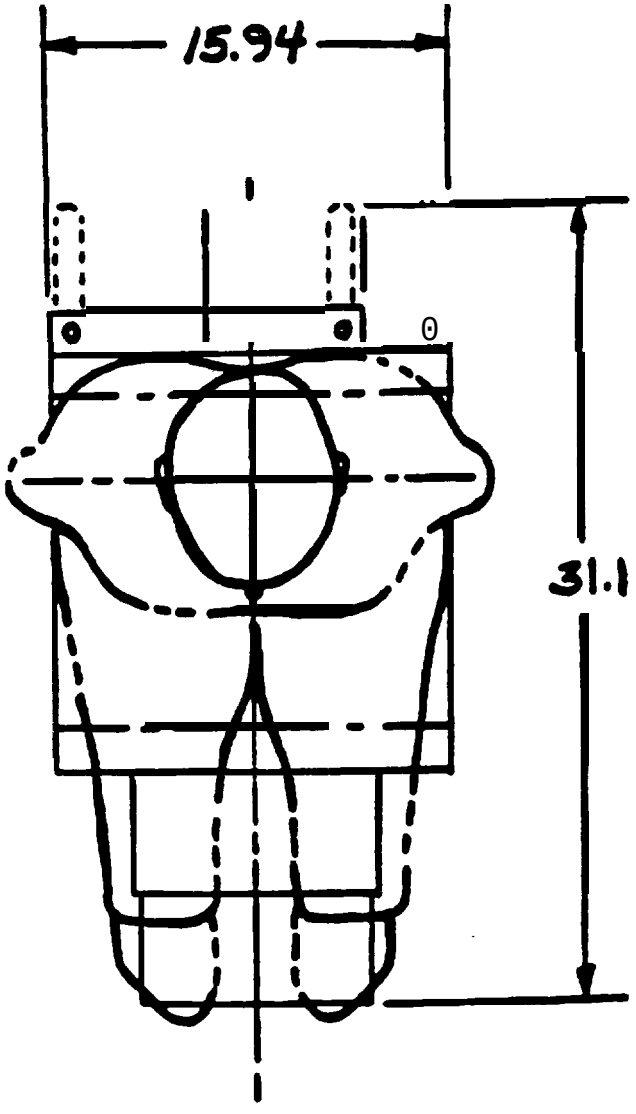
FULL DEPENDENT TRANS.
WITH & W/O TEMP ENCLOSURE

MC DONNELL DOUGLAS

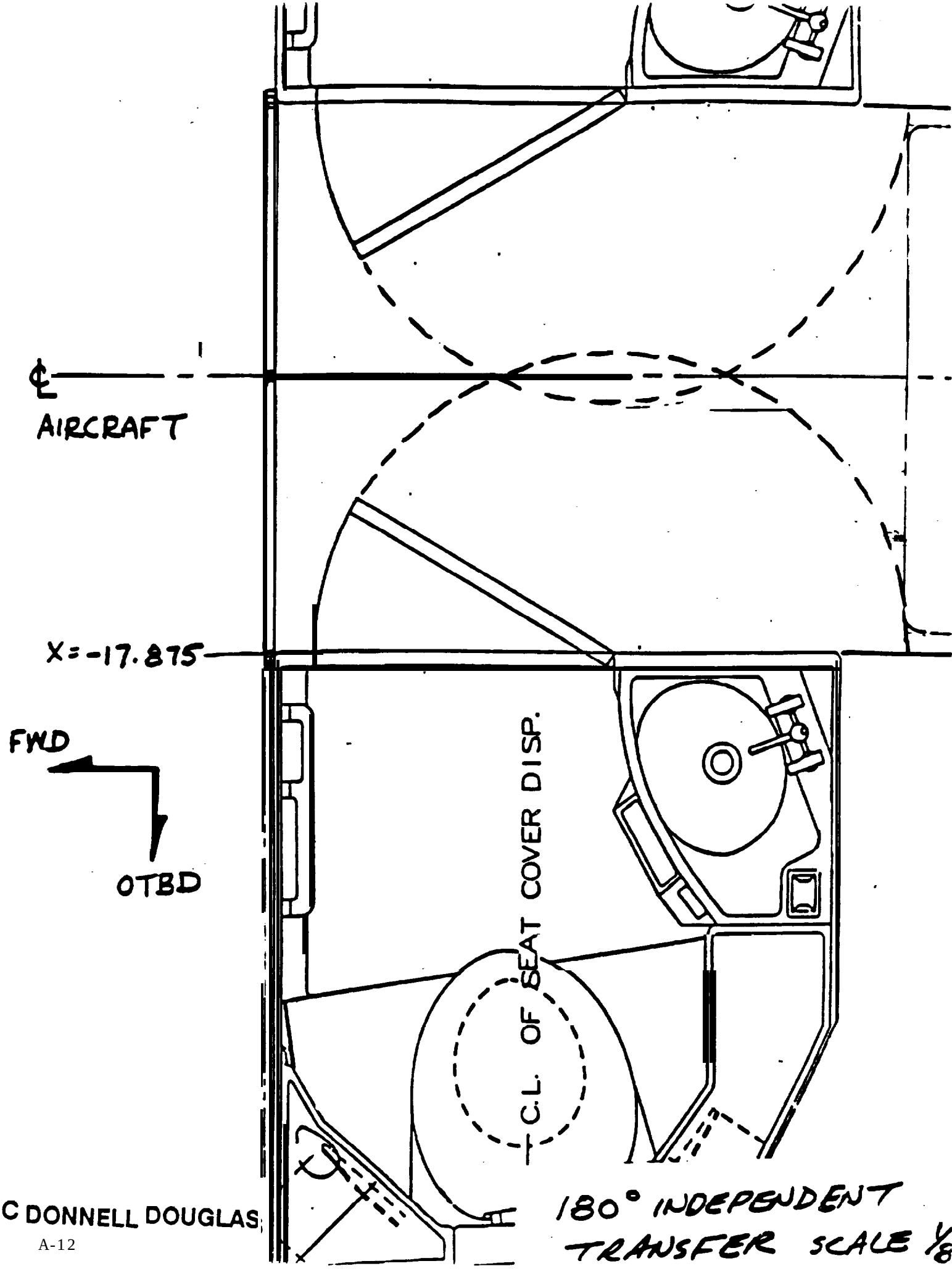


90° INDEPENDENT TRANSFER WITH TEMP ENCLOS.

SCALE - 1/8



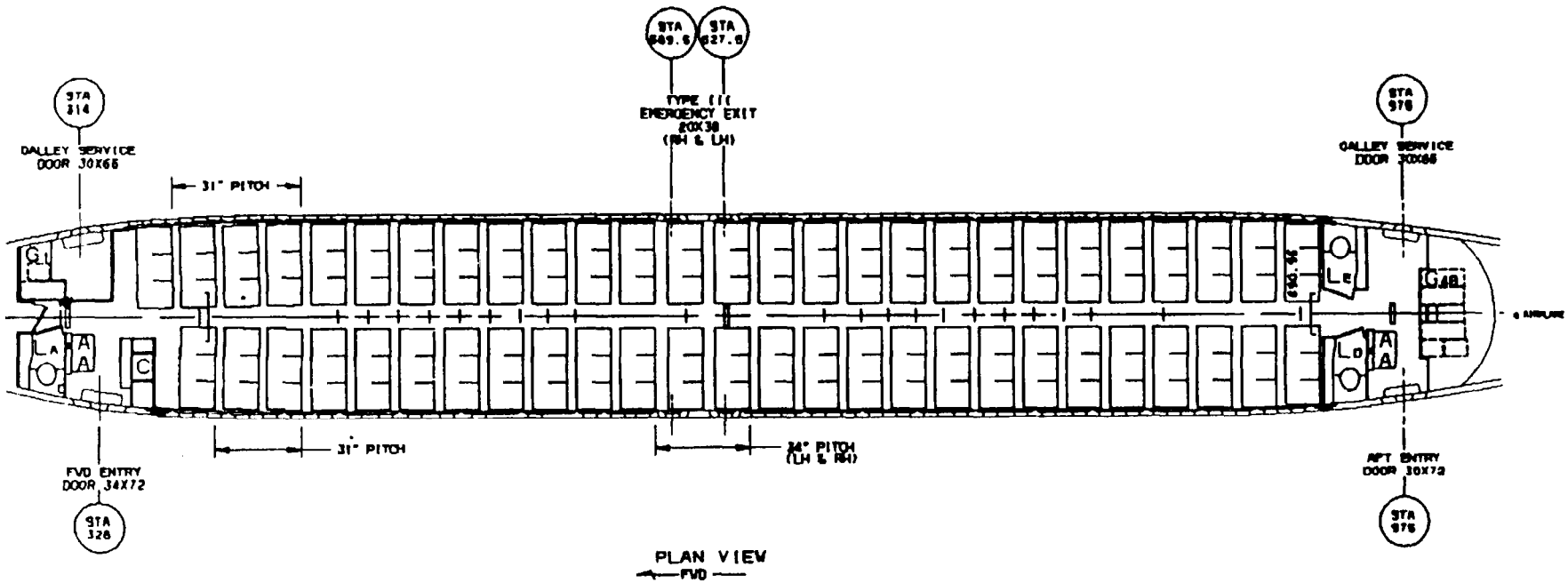
SCALE - 1/8



180° INDEPENDENT TRANSFER SCALE 1/8

DESIGN CONCEPTS
ACCESSIBLE LAVATORIES
FOR
SINGLE AISLE AIRCRAFT

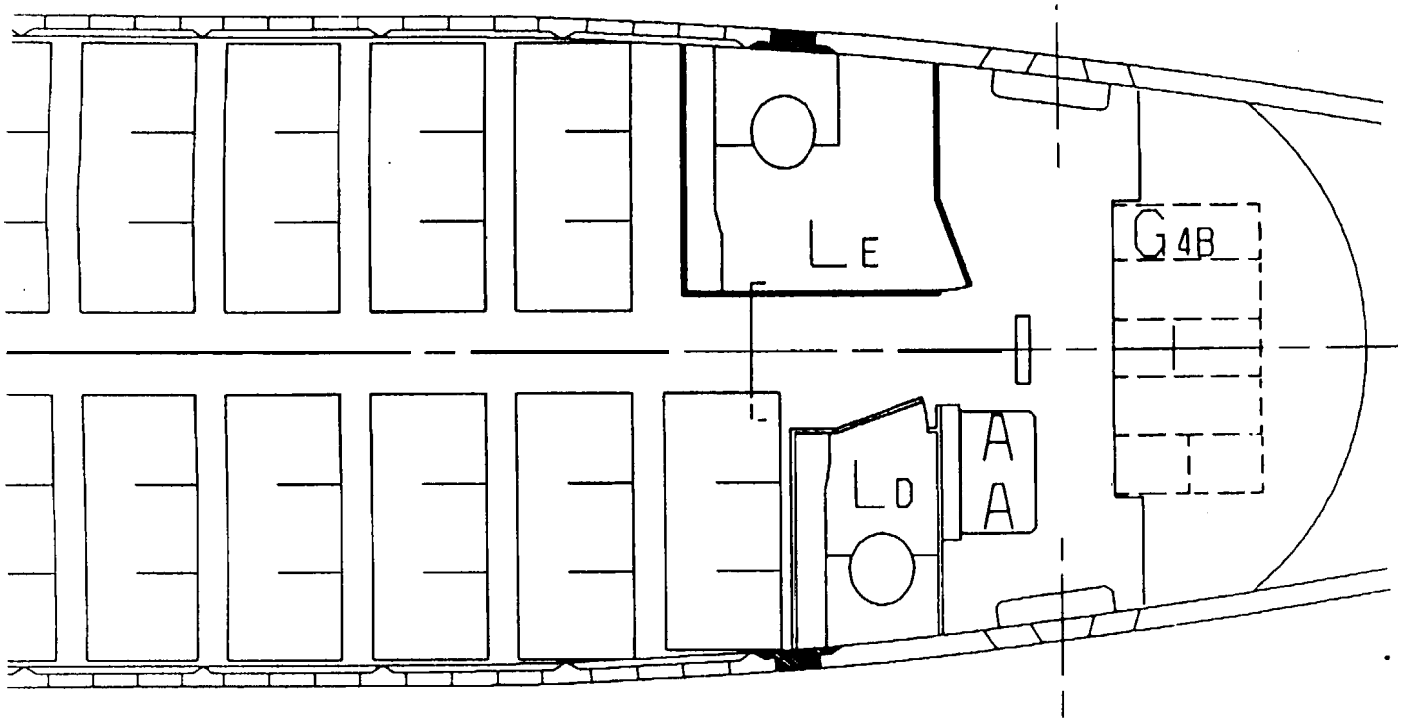
THE BOEING COMPANY
MODELS 737 & 757



159 TOURIST PASSENGERS - 32 IN. PITCH

BASELINE CONFIGURATION

MODEL 737-400



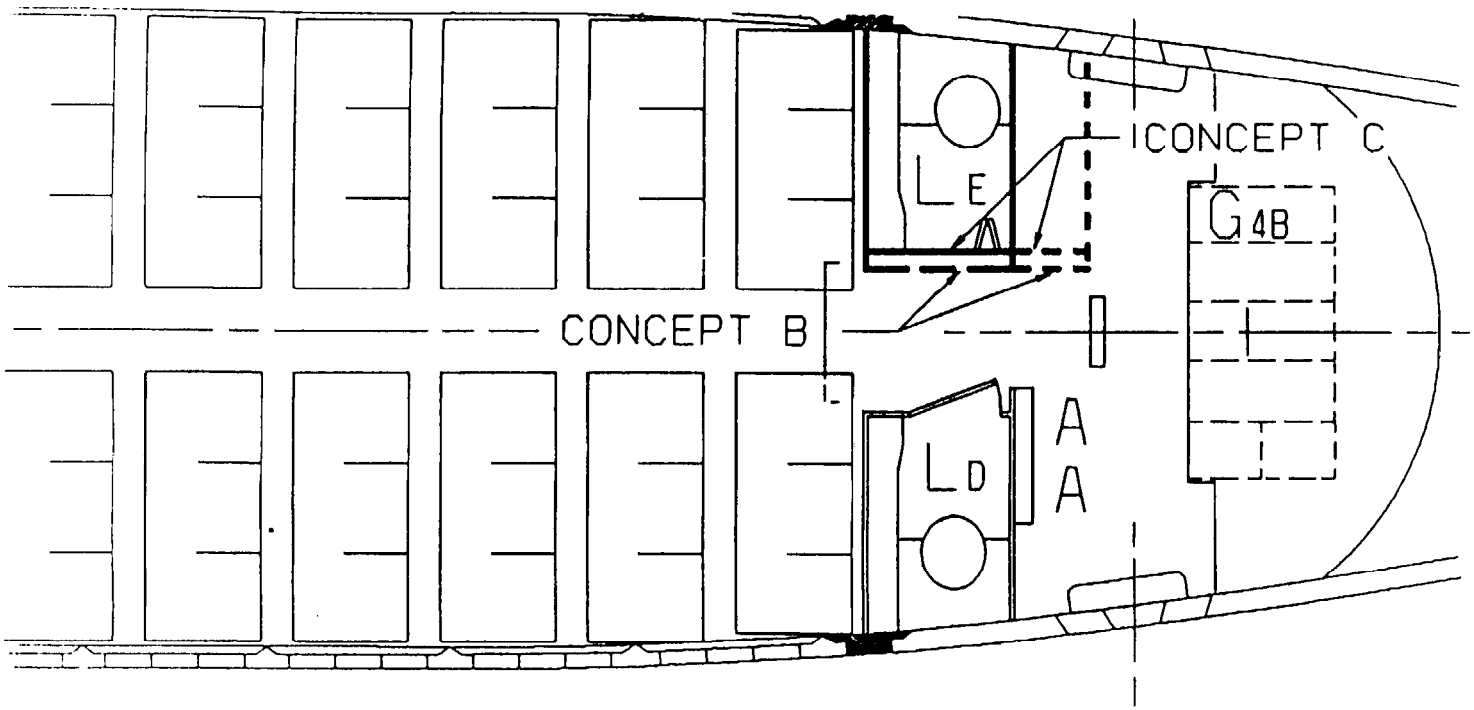
DESIGN CONCEPT A MODEL: 737-400

DESCRIPTION

FULLY CONTAINED LAVATORY
FULL ACCESSIBILITY FOR WHEELCHAIR
FULL DEPENDENT TRANSFER

IMPACT

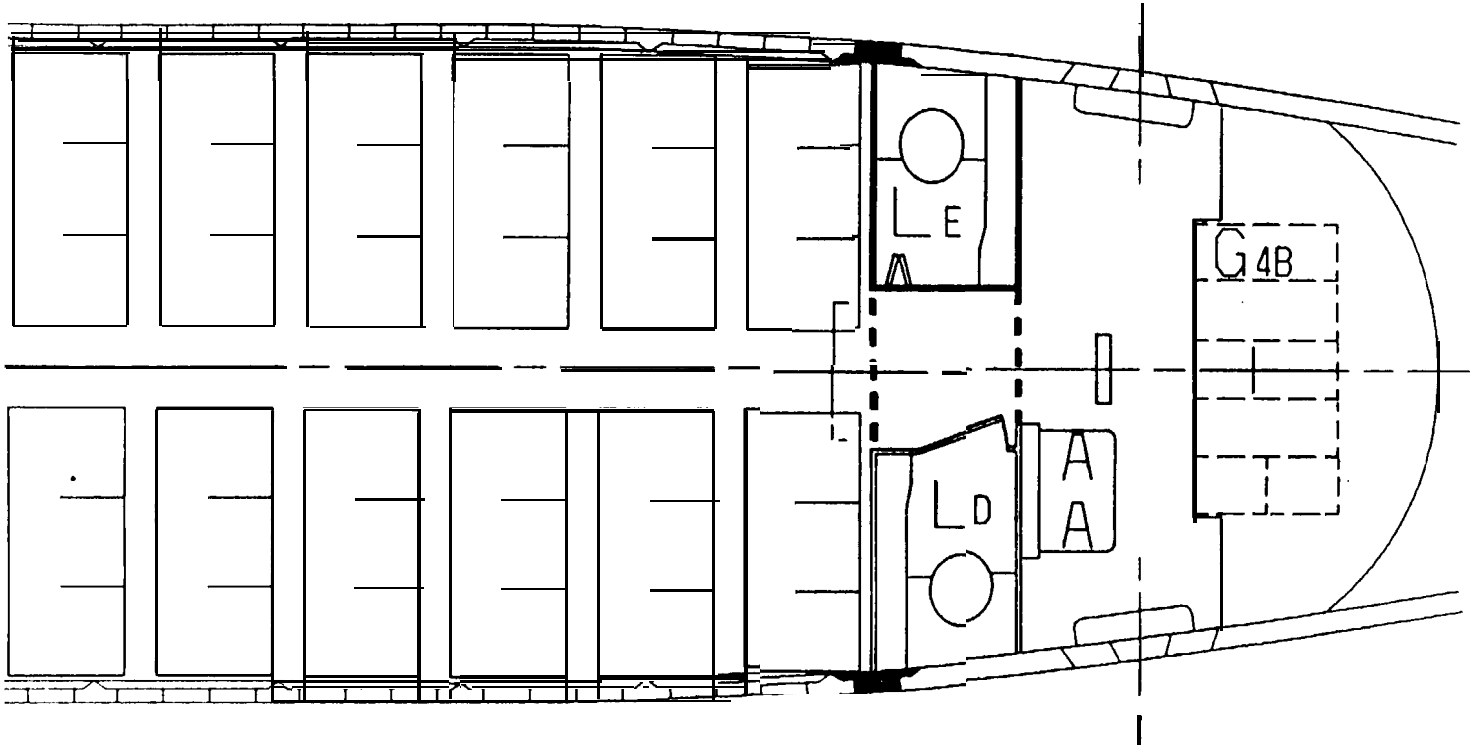
NEW LAVATORY
LOSS OF ONE TRIPLE SEAT
ALL NEW STRUCTURAL SUPPORT
RELOCATED WATER/WASTE SYSTEM
REVISED LIGHTING
REVISED CEILINGS/SIDEWALLS



DESIGN CONCEPT B AND C MODEL: 737-400

DESCRIPTION	IMPACT
LAVATORY USING TEMPORARY ENCLOSURE	NEW LAVATORY
FULL ACCESSIBILITY FOR WHEELCHAIR	NEW TEMPORARY ENCLOSURE
CONCEPT B: INCREASED SIZE LAVATORY	*REVISED STRUCTURAL SUPPORT
FULL DEPENDENT TRANSFER	RELOCATED WATER/WASTE SYSTEM
CONCEPT C: STANDARD SIZE LAVATORY	REVISED LIGHTING
90° INDEPENDENT TRANSFER	*REVISED CEILINGS

*CONCEPT B



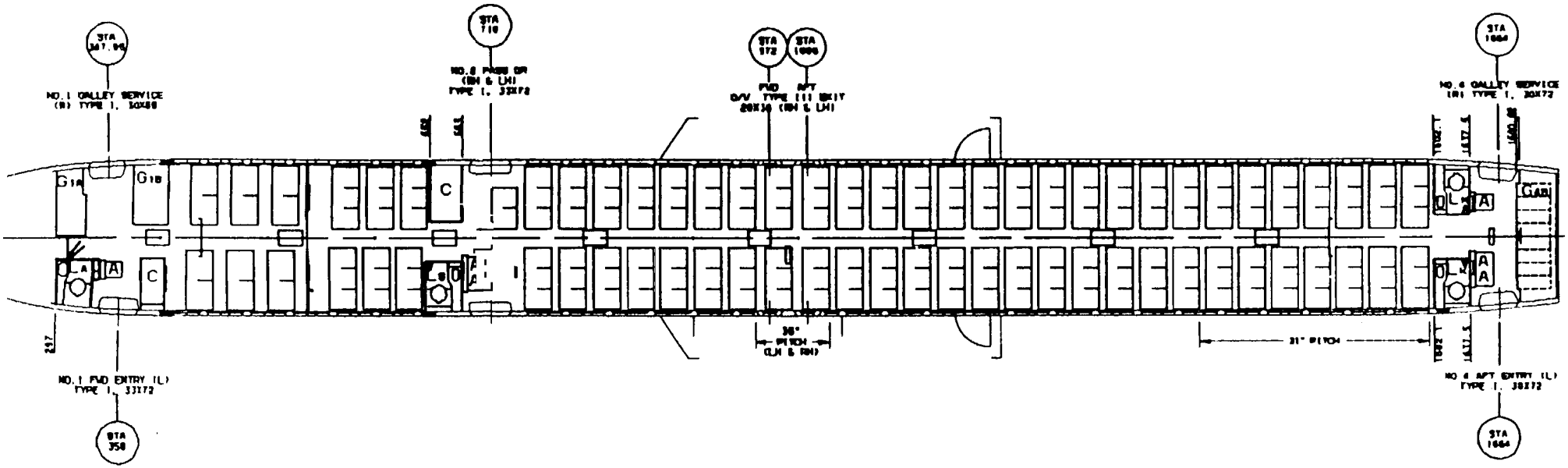
DES GN CONCEPT D MODEL: 737-400

DESCRIPTION

STANDARD SIZE LAVATORY USING TEMPORARY ENCLOSURE
LIMITED ACCESSIBILITY FOR WHEELCHAIR
180° INDEPENDENT TRANSFER

IMPACT

NEW TEMPORARY ENCLOSURE
REVISED LIGHTING



PLAN VIEW

FWD

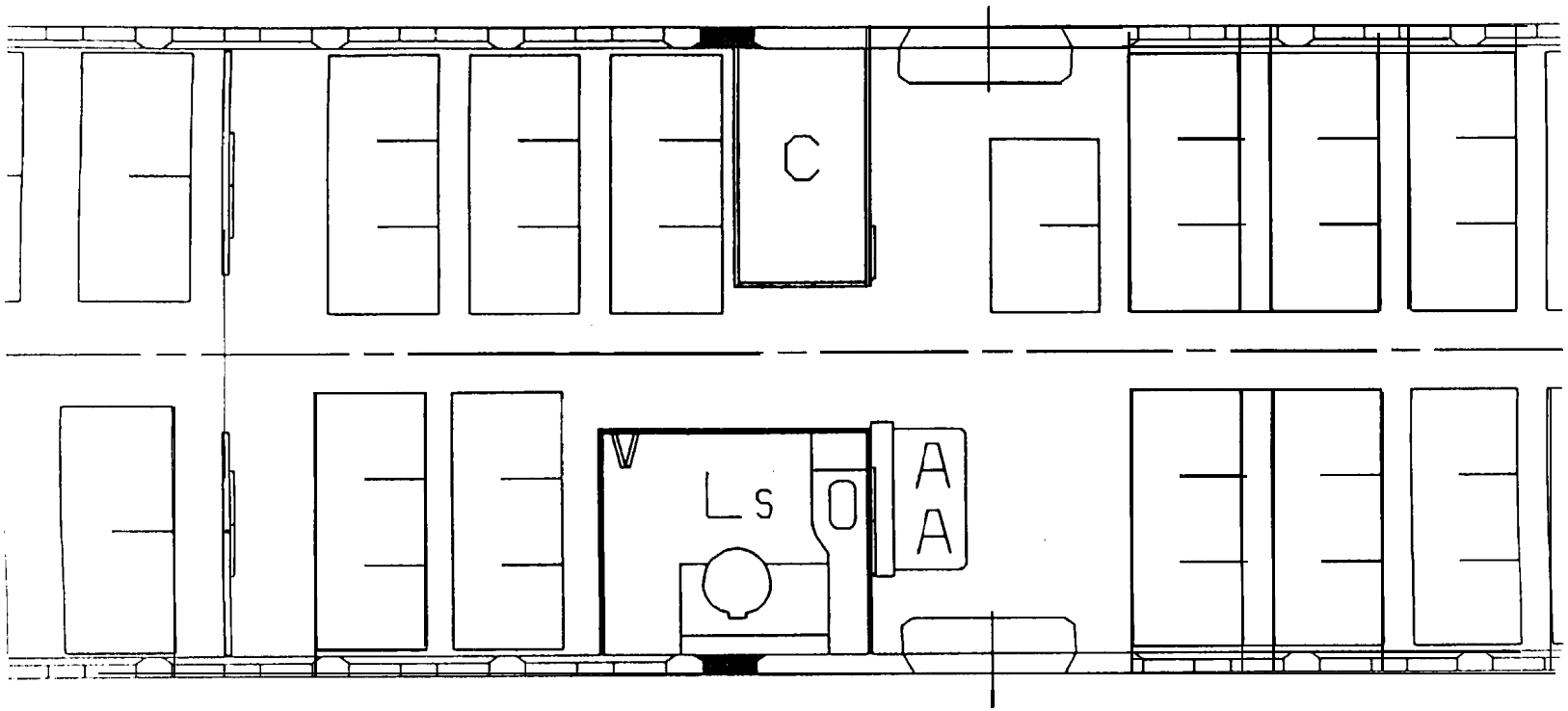
12 FIRST CLASS - 38 IN. PITCH

182 TOURIST CLASS - 32 IN. PITCH

194 TOTAL PASSENGERS

BASELINE CONFIGURATION

757-200



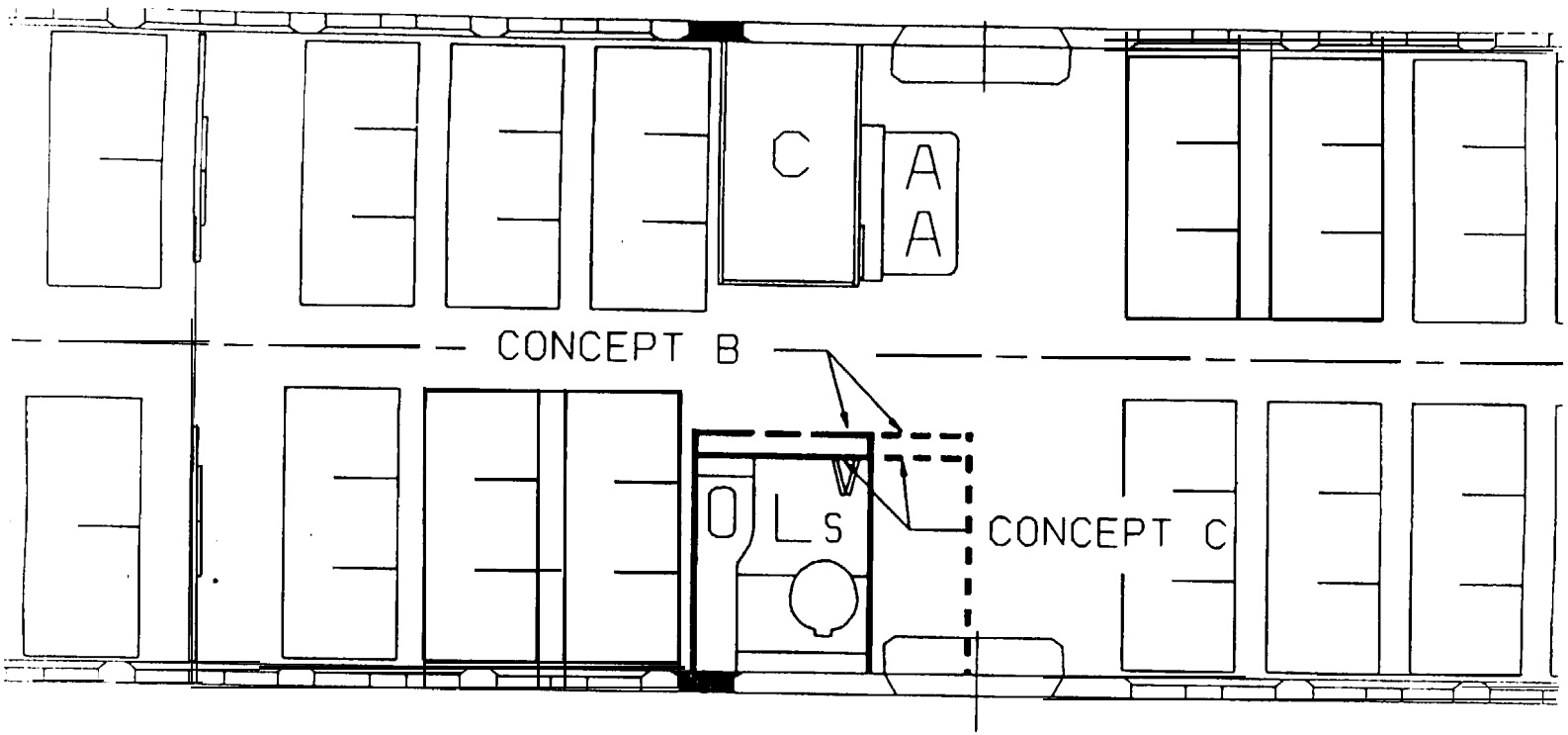
DESIGN CONCEPT A
MODEL: 757-200 DOOR NO. 2

DESCRIPTION

FULLY CONTAINED LAVATORY
FULL ACCESSIBILITY FOR WHEELCHAIR
FULL DEPENDENT TRANSFER

IMPACT

NEW LAVATORY
LOSS OF ONE TRIPLE SEAT
ALL NEW STRUCTURAL SUPPORT
REVISED LIGHTING
REVISED CEILINGS/SIDEWALLS



DESIGN CONCEPT B AND C
MODEL: 757-200, DOOR NO. 2

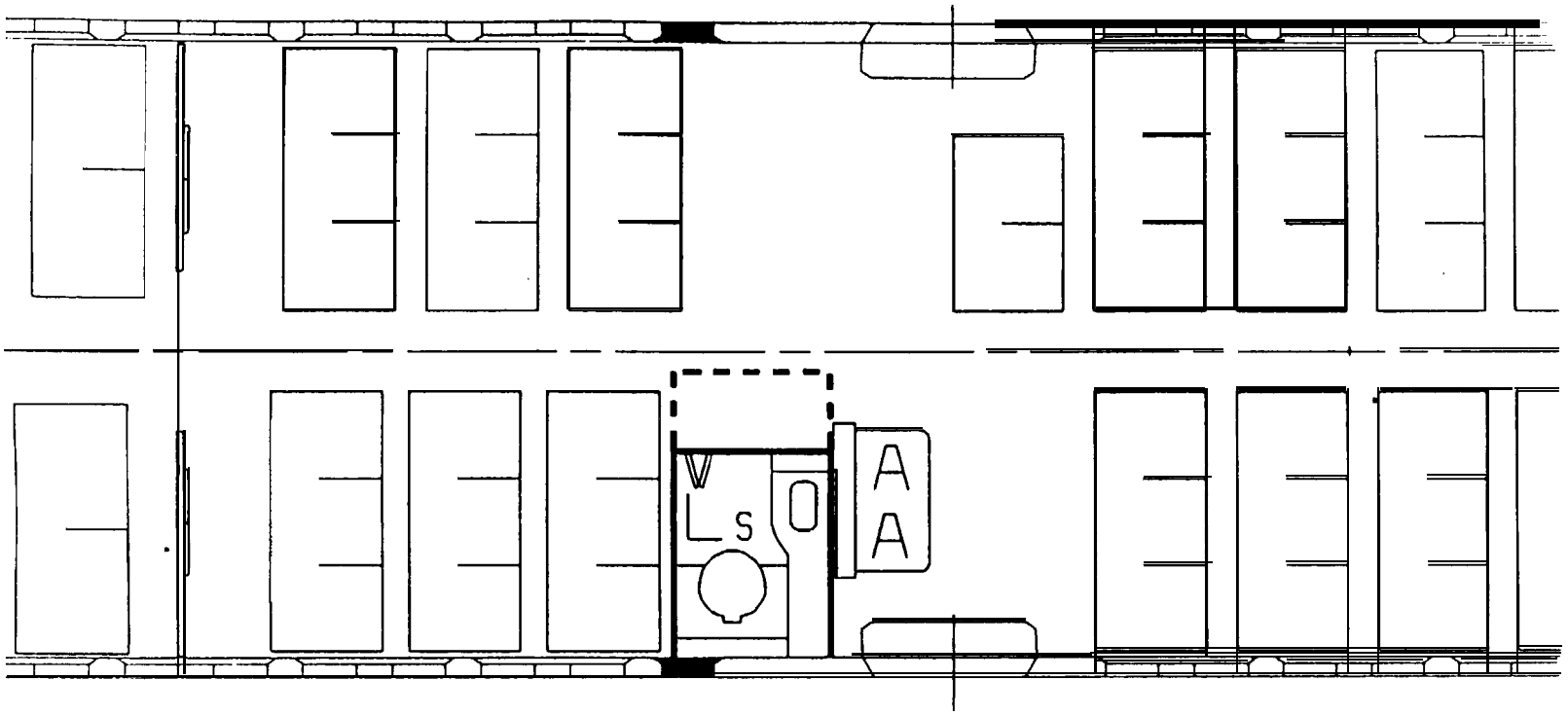
DESCRIPTION

LAVATORY USING TEMPORARY ENCLOSURE
FULL ACCESSIBILITY FOR WHEELCHAIR
CONCEPT B: INCREASED SIZE LAVATORY
FULL DEPENDENT TRANSFER
CONCEPT C: STANDARD SIZE LAVATORY
90° INDEPENDENT TRANSFER

IMPACT

NEW LAVATORY
NEW TEMPORARY ENCLOSURE
*REVISED STRUCTURAL SUPPORT
RELOCATED WATER/WASTE SYSTEM
REVISED LIGHTING
*REVISED CEILINGS

*CONCEPT B



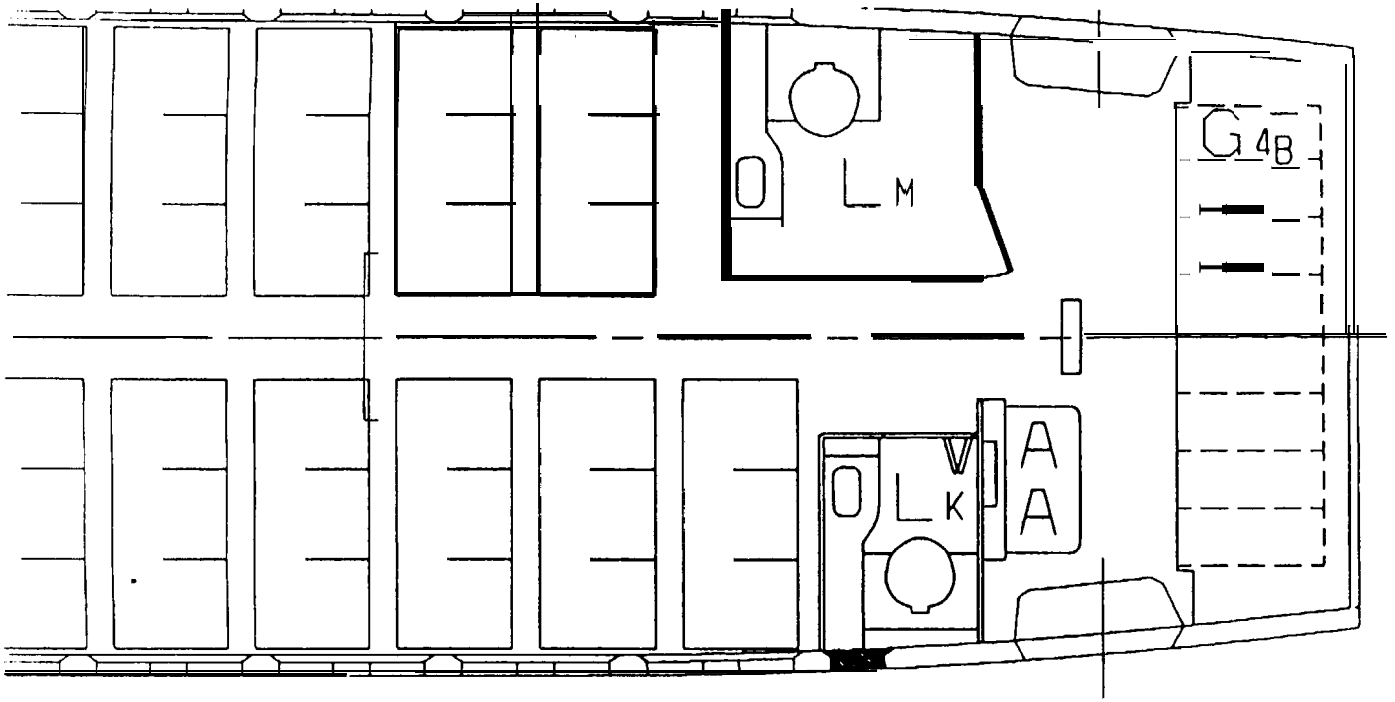
DESIGN CONCEPT D
MODEL: 757-200, DOOR NO. 2

DESCRIPTION

STANDARD SIZE LAVATORY USING TEMPORARY ENCLOSURE
LIMITED ACCESSIBILITY FOR WHEELCHAIR
180° INDEPENDENT TRANSFER

IMPACT

NEW TEMPORARY ENCLOSURE
LOSS OF CLOSET
RELOCATED VIDEO



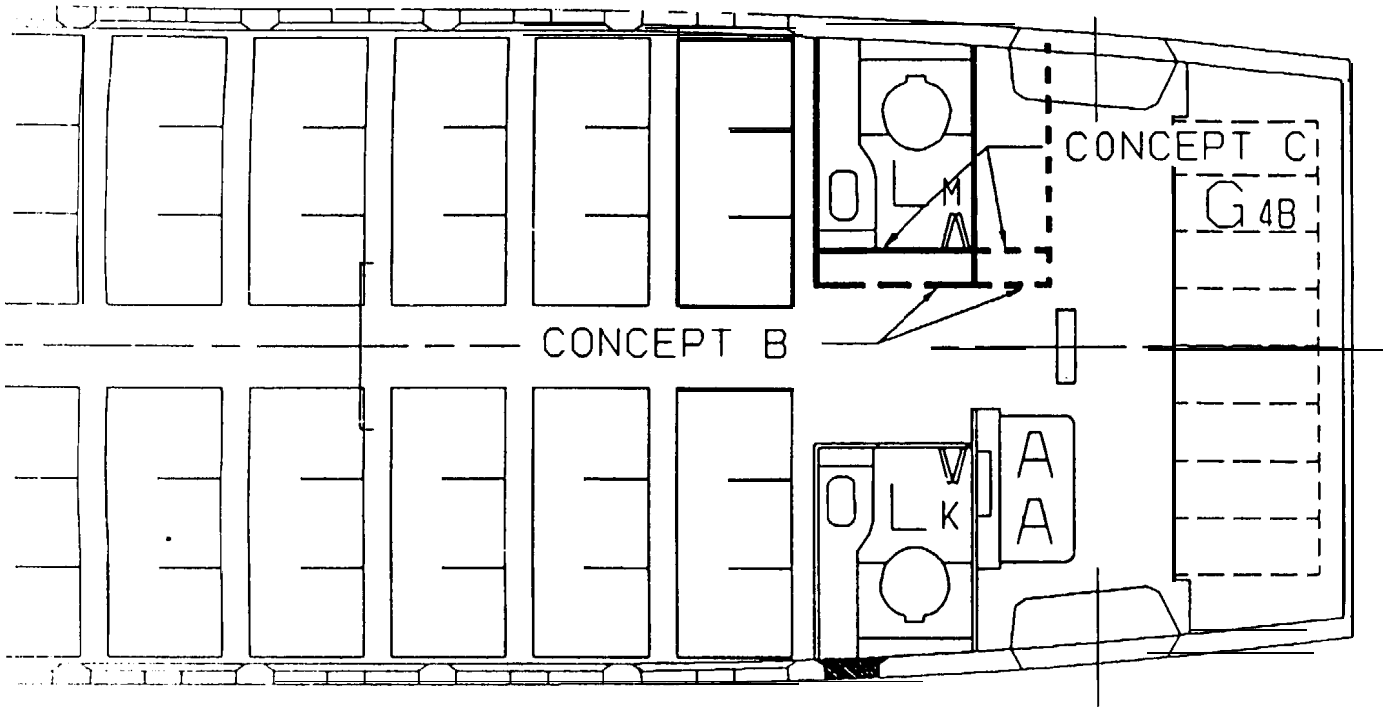
DESIGN CONCEPT A
MODEL: 757-200, AFT CABIN

DESCRIPTION

FULLY CONTAINED LAVATORY
FULL ACCESSIBILITY FOR WHEELCHAIR
FULL DEPENDENT TRANSFER

IMPACT

LOSS OF ONE TRIPLE SEAT
LOSS OF SINGLE ATTENDANT SEAT
ALL NEW STRUCTURAL SUPPORT
RELOCATED WATER/WASTE SYSTEM
REVISED LIGHTING
REVISED CEILINGS/SIDEWALLS



DESIGN CONCEPT B & C
MODEL: 75 +200, AFT CAB N

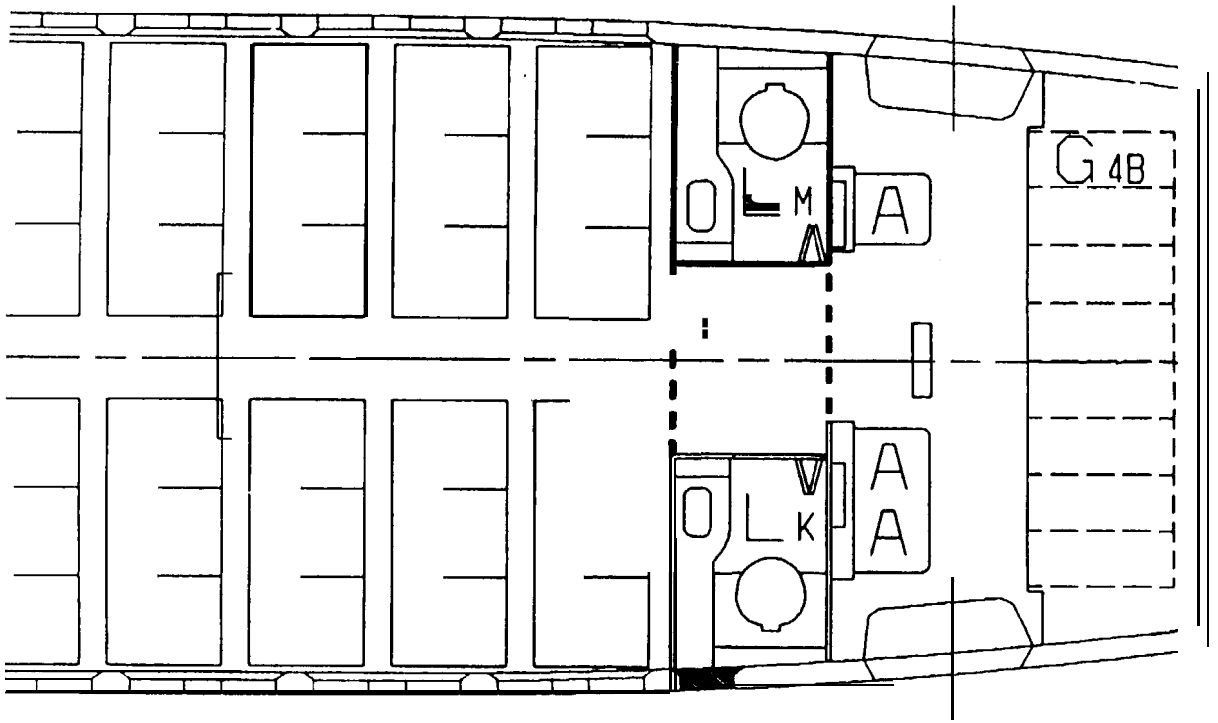
DESCRIPTION

LAVATORY USING TEMPORARY ENCLOSURE
FULL ACCESSIBILITY FOR WHEELCHAIR
CONCEPT B: INCREASED SIZE LAVATORY
FULL DEPENDENT TRANSFER
CONCEPT C: STANDARD SIZE LAVATORY
90° INDEPENDENT TRANSFER

IMPACT

NEW LAVATORY
NEW TEMPORARY ENCLOSURE
LOSS OF SINGLE ATTENDANT SEAT
*REVISED STRUCTURAL SUPPORT
*REVISED CEILINGS

*CONCEPT B



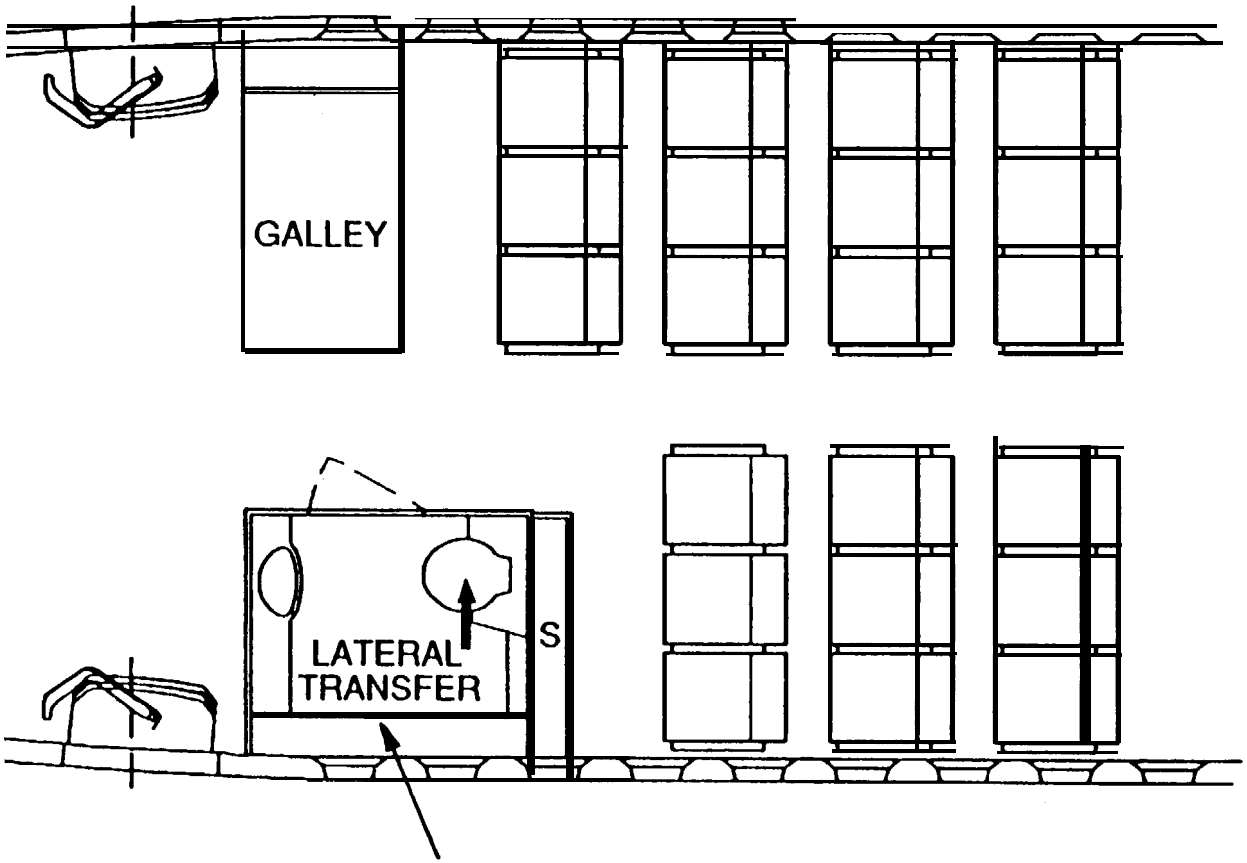
DESIGN CONCEPT D
MODEL: 757-200, AFT CABIN

DESCRIPTION

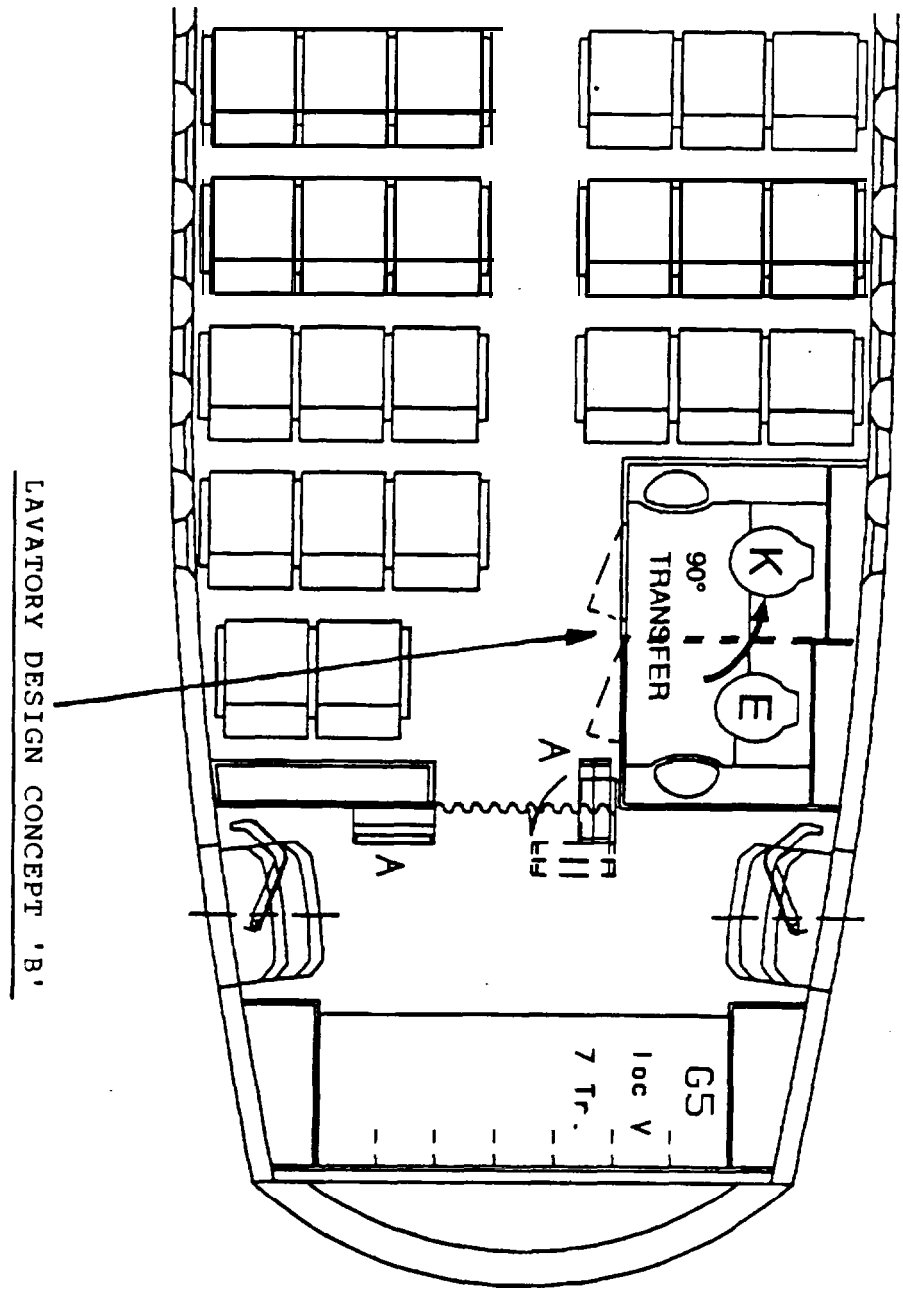
STANDARD SIZE LAVATORY USING TEMPORARY ENCLOSURE
LIMITED ACCESSIBILITY FOR WHEELCHAIR
180° INDEPENDENT TRANSFER

IMPACT

NEW TEMPORARY ENCLOSURE
REVISED LIGHTING



LAVATORY DESIGN CONCEPT 'A'

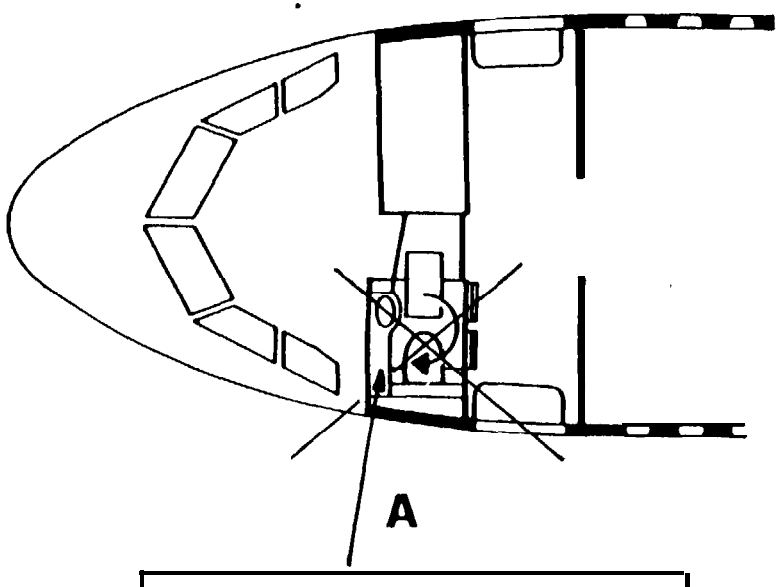


LAVATORY DESIGN CONCEPT 'B'

AIRBUS INDUSTRIE

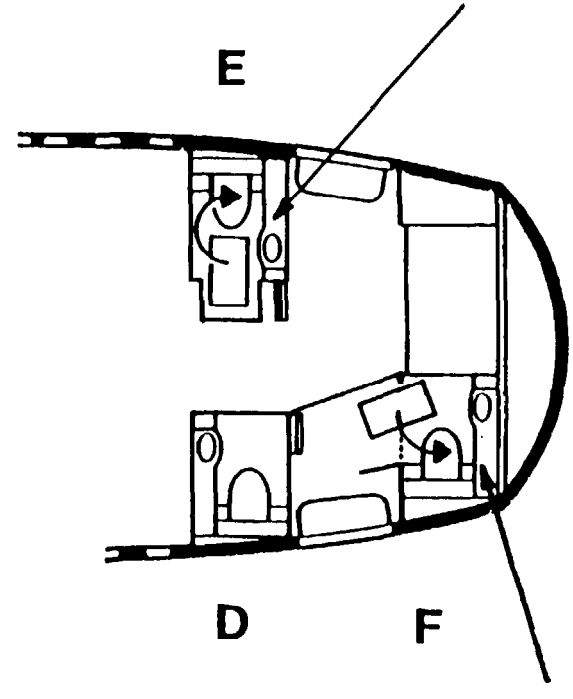
Lavatory Accessibility with On-Board-Wheelchair (Study Only)

(requiring pax effort for 90° or 180° transfer)



THIS LAVATORY DESIGN WILL INTERFERE WITH APPLICABLE AIRWORTHINESS REQUIREMENTS. IT HÒS THEREFORE BEEN USED ONLY ÒS Ò NEGATIVE EXAMPLE.

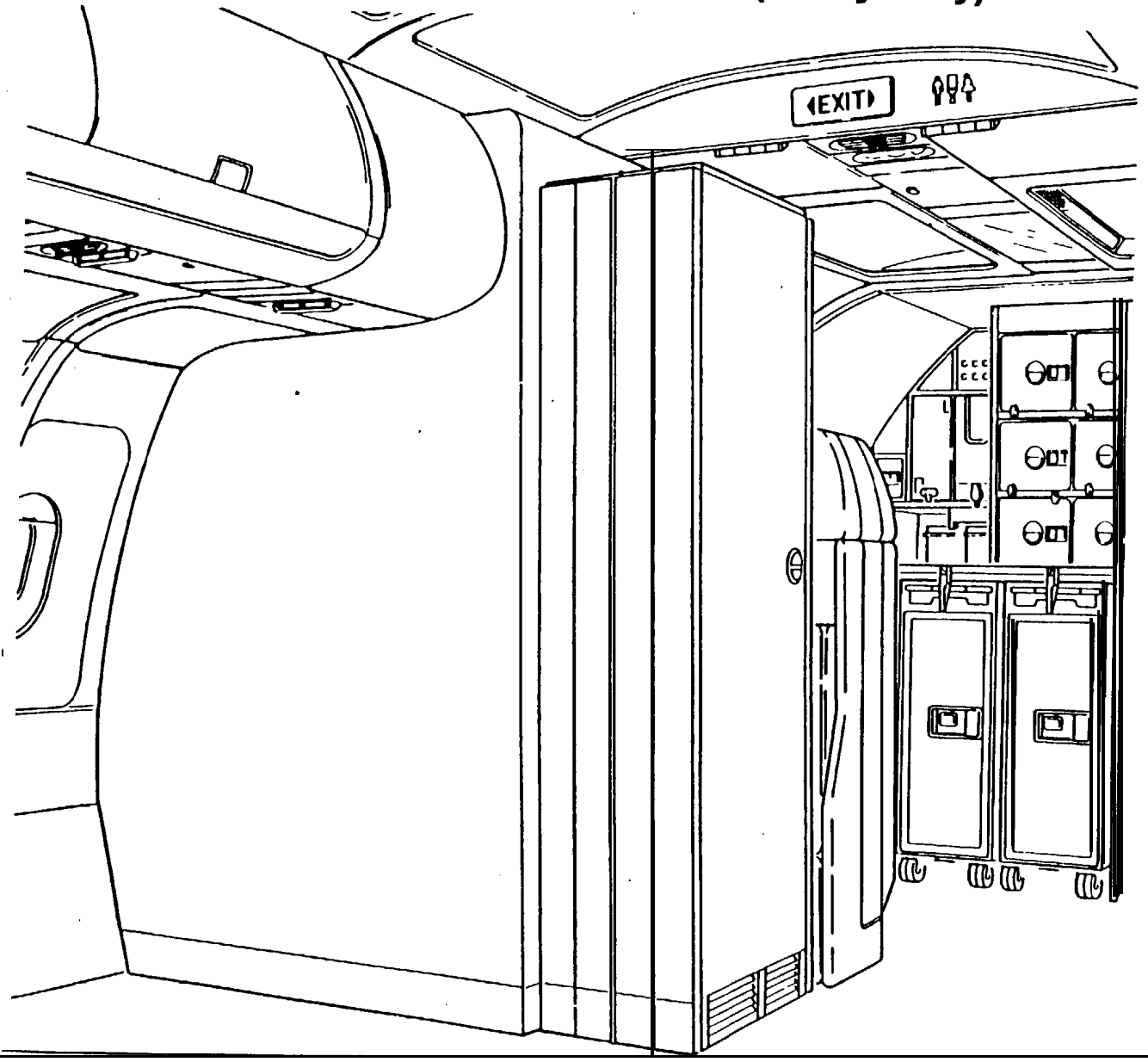
LAVATORY DESIGN CONCEPT 'D'

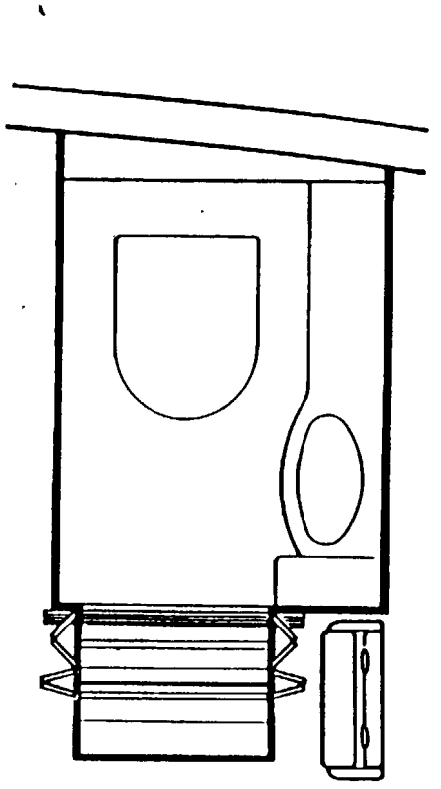


LAVATORY DESIGN CONCEPT 'C'

AIRBUS INDUSTRIE

Lavatory E Volume Increase (Study Only)

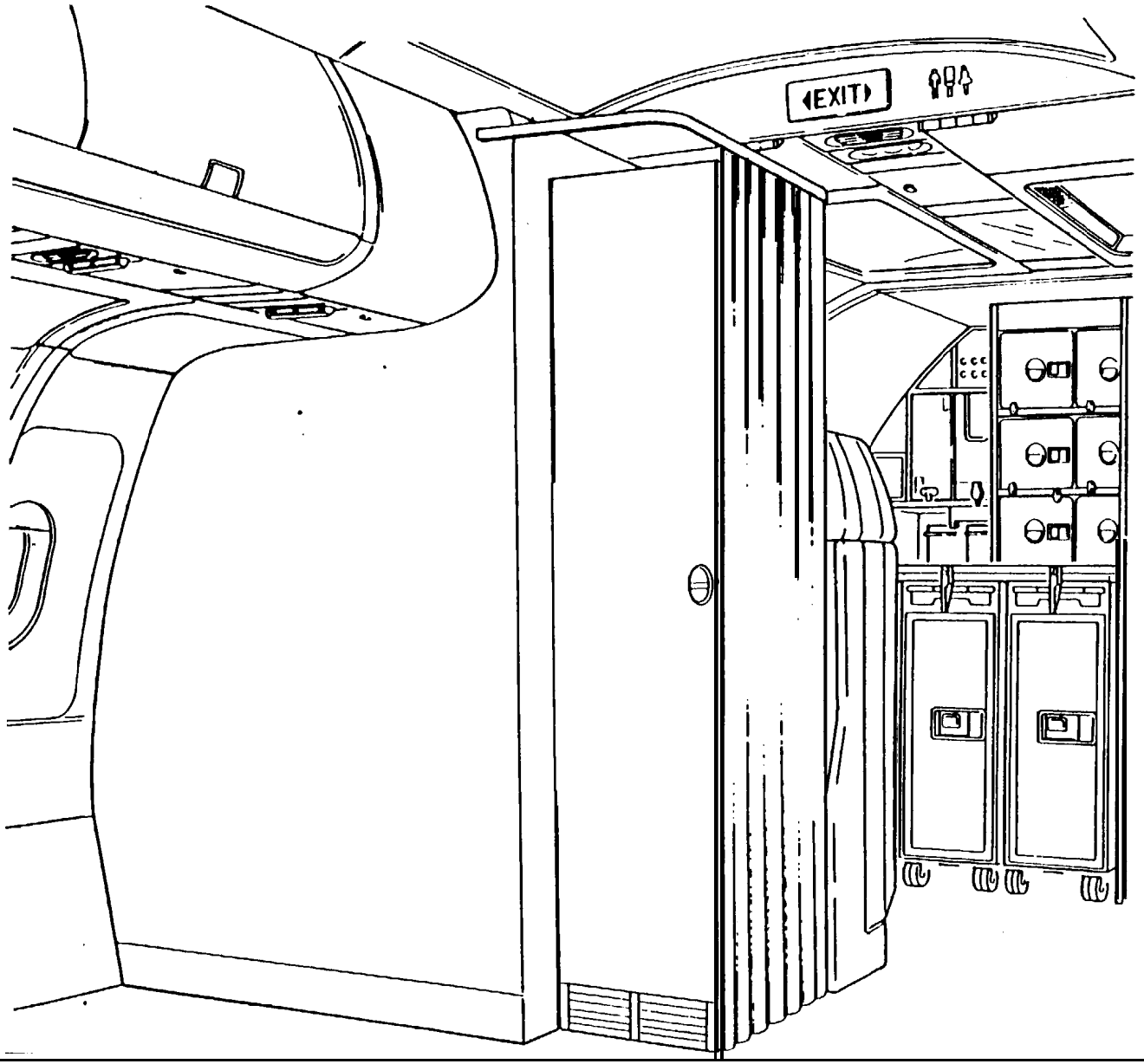


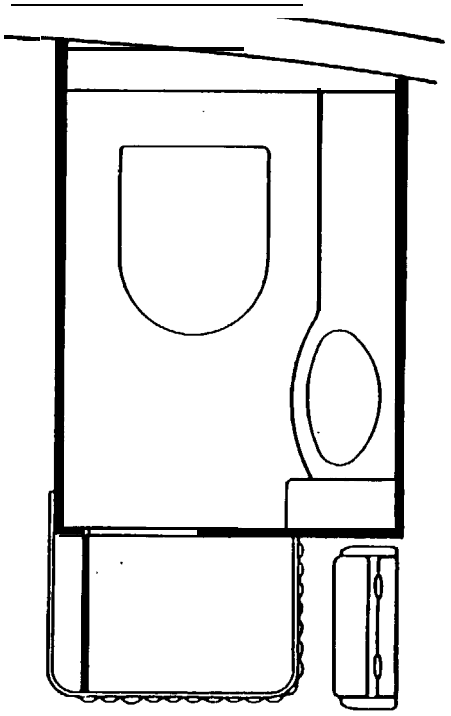


LAVATORY DESIGN

CONCEPT 'D'

Lavatory E Volume Increase (Study Only)





LAVATORY DESIGN
CONCEPT 'D'

APPENDIX B

AIRCRAFT ACCESSIBILITY FEDERAL ADVISORY COMMITTEE
JULY 29-30 MEETING
WASHINGTON, D.C.
SUMMARY MINUTES

The meeting was called to order by CoChairmen John Bollinger and Kirke Comstock. All members were present. Also present were representatives of advocacy groups and publishers. Verbatim transcripts of the meetings were taken and will be held at DOT for future reference. Members introduced themselves and their affiliations.

The Committee was graciously welcomed by Assistant Secretary Shane and Don Trilling. The work of the Committee was greatly facilitated by the untiring support of Ira Laster and other DOT representatives.

Prior to the meeting, members *were* provided copies of:

1. The original Federal Register notice announcing the formation of the Committee and detailing DOT's issues to be addressed;

2. the PVA co-sponsored Warren Report defining lavatory space needs for passengers with disabilities;

3. the draft suggested Design Guidelines for twin aisle lavatories for passengers with disabilities.

Since the Committee membership contains both people who were involved in developing the original guidelines above and others who were not involved, an extended discussion ensued concerning these documents and the issues they addressed. Concerns expressed in these discussions were, in many cases, similar to those expressed during the development of the original design guidelines document. This discussion was lively and productive. It is to the credit of the Committee members that the many complexities of this previous work were covered so expeditiously.

The Committee then moved on to a review of the issues presented in the Federal Register.

Initially it was felt that these could be clustered in some manner to provide a focus for work by Committee members. As the discussion progressed, another approach emerged that showed more promise as a course of action to ultimately address the DOT issues. This approach could be generally described as looking at real life situations in contemporary aircraft to form a basis for judgement. This would involve inspection of actual aircraft and evaluation of alternative design solutions for single aisle aircraft currently in production. Accordingly, an action list was developed as follows:

Don Trilling announced that he will be off on a six-month special assignment that will limit his availability to the Committee. His involvement, concern, and wise counsel will be missed.

Kirke Comstock John Bollinger

AIRCRAFT ACCESSIBILITY FEDERAL ADVISORY COMMITTEE
DECEMBER 9 AND 10, 1992
DEPARTMENT OF TRANSPORTATION HEADQUARTERS
WASHINGTON, D.C.
SUMMARY MINUTES

The Committee met to continue its work towards development of a report for the Department of Transportation dealing with accessible toilets on single-aisle (narrow-body) aircraft.

Attached to these minutes are:

a. The November 16, 1992, Federal Register Notice
b. a list of attendees at December 1992 meeting
b. a data sheet on smaller single-aisle aircraft
c. presentation material on Fokker aircraft
d. presentation material concerning accessible features on United 767-300 and 747-400 lavatories

Members again introduced themelves, followed by Ira Laster's discussion of a few "housekeeping" matters.

Robert Ashby briefly reviewed the lavatory and other accessibility requirements in DOT's existing regulation implementing the Air Carrier Access Act. He pointed out that there requirements are to be phased in over a period of time.

The current charge to the Advisory Committee involve8 single-aisle aircraft with 100-199 passenger seats. Suggestions for otherwise limiting (if at all) the size or quantity of aircraft to be modified included using:

a. Aircraft seat count (maximum capacity).
b. Stage length (this was viewed as being difficult to measure and administer).

Following considerable discussion of possible approaches for addressing the "cut-off " matter, the one that seemed to have broadest support would be based on the following:

a. Seat count (maximum).
b. A size cut-off for existing designs i.e., 100 seats.
c. A size cut-off for new designs that goes further, e.g. 60 seats.
d. Compliance required on new production aircraft delivered 2 years after the final rule is issued, or ordered after the effective date of the final rule.

Although there was no consensus, a majority of the members appeared to support something along the above lines. Such an approach was thought likely to be presented in the final report, on the understanding that other points of view will also be reflected in it.

The Fokker Aircraft Company presentation showed the difficulties that the Fokker 100 and 70 aircraft would have, because any accessible lavatories would be bounded by large engine support frames and aft pressure bulkheads, much like the MD-80. Also, space that might otherwise be used to expand the existing lavatory area for accessibility purposes has been preempted by electric equipment.

The discussion also emphasized the point that smaller commuter aircraft not only have seriously limited lavatory spaces, but also have access problems in general, due to the limitations created by the FAA Exit Row Rule and constrained space overall. The Committee's charter (100 seat lower cut-off), plus the limitations mentioned earlier, suggests that further consideration of smaller commuter aircraft is beyond the reach of the Committee. DOT will, nevertheless, be encouraged to pursue a solution for these aircraft.

This agrement, of course, places a heavy responsibility on members to provide information, concerns, data, etc., to those drafting the report. In particular, comments and data should cover:

a. Scope of a rule
b. Timing of a rule
c. Economic consequences/benefits
d. Consistency with the twin-aisle rule
e. Other issues not cited by DOT
f. Manufacturing cycle times
g. Impact of smaller aircraft size on architectural and material design solutions
h. Passenger cabin operational safety issues
i. Conflicts between safety rules and access rules (e.g., exit row rule)

At the end of the meeting, the Committee again went through the nine questions in the original Federal Register notice. These were repeated in the November 16, 1992, Federal Register notice attached to these minutes. To summarize remarks at this point in the meeting:

Question:
1. Can be done
2-5. Will be presented in final report with discussion, trade-offs, etc.
6. Not negotiable, will be safe.
7. A number of locations, not a problem.
8. See earlier discussion in minutes.
9. See earlier discussion in minutes.

Once again, the untiring and professional support of Ira Laster and Nancy Ebersole is gratefully acknowledged.

Kirke Comstock Maureen McCloskey

Attachments

AIRCRAFT ACCESSIBILITY FEDERAL ADVISORY COMMITTEE
September 16 and 17, 1992
WASHINGTON, D.C.
SUMMARY MINUTES

The meeting was called to order by Co-Chairmen John Bollinger and Kirke Cornstock. Most members were present. Also present were representatives of advocacy groups and publishers. Verbatim transcripts of the meeting discussions were taken and will be held at DOT for future reference. Members and guests introduced themselves and described their affiliations.

The Committee was welcomed by representatives of the Secretary's staff. The work of the Committee continues to be greatly facilitated by the untiring support of Ira Laster and Nancy Ebersole from DOT. A copy of the agenda for the meeting is attached. As planned at the August meeting, the Committee then proceeded with the agenda and the assignments from the previous meeting.

1. Evaluation of "Typical" Aircraft for Accessibility: Excellent presentations *were* made by representatives of Airbus, Boeing, and McDonnell/Douglas. These were developed per the protocol attached. Copies were provided to all Committee members. Aircraft evaluated, generically, were A-321, MD-80, B-737-30 and B-727-200. All of these presentations showed that, in general, sufficient space existed to provide dependent transfer capability through the use of a lavatory enclosure (without seat loss). These were not detailed design studies for specific airlines, and details regarding crew seat placement, enclosure material construction, etc., were not addressed. This was a "real estate" evaluation. These presentations generated comment, concerns, and questions. These included:

   a. Will future flight attendant direct view requirements compromise accessibility? It was agreed that this just becomes another item that must be accounted for in the final detailed design. There may be an impact on accessibility, seat count, or other factors.

   b. Airlines may have to accept seat loss to meet-a social need. Understood, but designers and airlines will continue to struggle mightily to avoid such an outcome.

   The airframe companies were complimented for their good work in developing these presentations.

2. On-Board Wheelchairs: We were shown three different on-board chairs. Some of them *were* used for subsequent evaluation of aircraft at DCA. While there was no need for Committee to make any specific recommendations to the FAA on this subject, this presentation did provide further background for members.

5. "Facilitation" Demonstration. Gerry Warren briefly reviewed the development of spatial requirements in his original PVA report (members have copies). He then proceeded to preview a videotape used to record the tests (using actual disabled subjects). These tests were conducted on a specific lavatory design as an "equivalent facilitation" to show that this design is adequate per the Design Guidelines. There was a side discussion about whether the Warren report numbers were "minimum" or "maximum." This will be resolved independently with Paralyzed Veterans of America (sponsors of the Report).

6. New Business:

1. Future meeting dates. The following dates were agreed to, for planning purposes:

12/9 and 12/10/92
3/10 and 3/11/93
6/23 and 6/24/93
8/18 and 8/19/93

It may not be necessary to have all of those meetings.

2. Action agenda

a. Aircraft size "cut off";
b. Feasibility of access to narrow-body aircraft;
c. Existing guidelines document; and
d. Issues

Lavatory Enclosure as Defined in Existing Guidelines Document
Seat Loss/Cost for Different Models of Aircraft
Warren Video
Committee Final Report Outline

Discussion then ensued with the following outcome:

1. Aircraft size "cut off."

Everyone agreed that 100 seats is clearly appropriate and that more understanding of aircraft in the 60-99 seat range is needed prior to deciding whether 60 seats is a more appropriate "cut off."

ACTION: Mike Rioux, ATA and Walt Coleman, RAA to obtain data on any existing aircraft in the 60-99 seat size and forward to Ira Laster for distribution to Committee members.

APPENDIX C

APPENDIX C
MEMBERS OF AIRCRAFT ACCESSIBILITY FEDERAL ADVISORY COMMITTEE

NAME	ORGANIZATION
Robert C. Ashby	Department of Transportation
John Bollinger (Maureen McCloskey, Alternate)	Paralyzed Veterans of American
Barbara Cahill-Melendez	Phoenix Community Council, Inc.
Kirke Comstock	United Airlines
David M. Capozzi (Dennis Cannon, Alternate)	Architectural and Transportation Barriers Compliance Board
Speed Davis	Massachusetts Office on Disability
Nancy Ebersole	Department of Transportation
Pete Ellins	Boeing Commercial Airplane Company
Webster Heath (Dean Klippert, Alternate)	McDonnell Douglas Aircraft Company
Judith Heumann (Hale Zukas, Alternate)	World Institute on Disability
Holger Hindrichs (Dennis Murphy, Alternate)	Airbus Industrie of North America
Anne-Marie Hughey	National Council on Independent Living
Katharine Hunter-Zaworski	Oregon State University
Cheryl Hurst	American Airlines, Inc.
Mauricio Kuttler	Federal Aviation Administration
Ira Laster, Jr.	Department of Transportation
Dean Resch	Federal Aviation Administration
Michael F. Rioux	Air Transport Association of America
Harold W. Snider	National Council on People With Disabilities

APPENDIX C CONTINUED

Margie A. Tillotson	Continental Airlines, Inc.
Donald R. Trilling	Department of Transportation
C. Gerald Warren	C. Gerald Warren and Associates
Christopher J. Witkowski (Meg Leith and Mary K Hanke, Alternates)	Association of Flight Attendants
Bob Williams	United Cerebral Palsy Association

OTHER PARTICIPANTS ON AIRCRAFT ACCESSIBILITY
FEDERAL ADVISORY COMMITTEE

NAME	ORGANIZATION
Andras Biesewig	Deutsche Airbus
Brad Brown	Litchfield Group
Joseph Canny	Department of Transportation
Paul Cohen	Commuter Air Magazine
Walter Coleman	Regional Airline Association
Hoyte Decker	Department of Transportation
Alan Driver	British Aerospace
Scott Hardman	S.P. Aerospace, Inc.
Arthur J. Hayes	Federal Aviation Administration
Donald Kamenz	Dornier Aviation
Suzanne Lubin	International Airline Passenger Association
Diana Lundie	Regional Airline Association
Shawn McDermott	Paralyzed Veterans of America
Karen Ott-Worrow	Disability Law Reporter Service
Bruce Rocholl	Saab Aircraft
Phillip Sarozek	Southern California Safety Institute
Robert Skornick	Paralyzed Veterans of America
David S. Stempler	International Airline Passengers Association
Robert P. Thurber	Department of Transportation
Joost Van De Griendt	Fokker Aircraft
Henry Van Doorn	
Sara Yerks	National Fire Protection Association

APPENDIX D

8078 Federal Register / Vol. 55, No. 44 / Tuesday, March 6. 1990 / proposed Rules

14 CFR Part 382

[Docket No. 46811; Notice 90-10]

RIN 2105-AB60

Nondiscrimination on the Basis of Handicap In Air Travel

AGENCY: Office of the Secretary. DOT.

ACTION: Advance notice of proposed rulemaking (ANPRM).

SUMMARY: Thir advance notice of proposed rulemaking asks for comment on a number of issues related to the rulemaking to implement the Air Carrier Access Act of 1986, on which the Department believes that more information is necessary before decisions can be made. The Department will propose to amend its final Air Carrier Access Act rule if we conclude, in response to comments to this notice. that additional provisions or changes in existing provisions are warranted.

DATES: Comments should be received by July 5.1990. Late-filed comments will be considered to the extent practicable.

ADDRESSES: Comments should be sent to Docket Clerk. Docket No. 46811, Department of Transportation, 400 7th Street, SW., Washington, DC 20590, room 4107. For the convenience of Persons who will be reviewing the docket. it is requested that commenters provide duplicate copies of their comments. Comments will be available for inspection at this address Monday through Friday from 9 a.m. through 5:30 p.m. Commenters who wish the receipt of their comments to be acknowledged should include a stamped. self-addressed postcard with their comments. The docket clerk will date-stamp the postcard and mail it to the commenter.

FOR FURTHER INFORMATION CONTACT: Donald Trilling or Ira Laster. Office of Policy and International Affairs. Department of Transportation. 400 7th St.. SW.. room 9117. Washington. DC 20590. Telephone 202-366-4813. A taped copy of the ANPRM is available upon request.

SUPPLEMENTARY INFORMATION: This advance notice of proposed rulemaking (ANPRM) requests comment on two features of great importance to those with mobility impairments: (1) Lifts and other boarding equipment for use in regional and commuter aircraft and air taxis, and 2) accessible lavatories and narrowbody (i.e.. aircraft with only one aisle) and smaller aircraft. The ANPRM also seeks comment on matters concerning additional accommodations for penons with hearing impairments that were mentioned in comments to the docket on the Air Carrier Access Act rule.

The Department made specific proposals on the provision of boarding equipment (including use of ground wheelchairs, boarding chairs. ramps or mechanical devices) to assist passengers in enplaning and deplaning. and proposed a series of design and equipment requirements for accessible lavatories in the June 22, 1988 NPRM. That NPRM requested comment on whether mechanical lifts should be required, as opposed to other means (e.g., boarding chairs, handlifting) to assist disabled passengers on and off aircraft. and whether specific standards should be set for boarding chairs. With regard to the accessible lavatory proposals. comments were requested on: (1) What alternative arrangements which would best protect the privacy of on-board chair passengers in using such lavatories and (2) how best to implement accessible features in lavatories without removal of revenue seats.

The Department received few useful comments on these issues. Disability groups stated that nothing in the ACAA exempts any aircraft from providing accessible lavatories regardless of a revenue seat loss. The airline industry opposed any requirement for accessible lavatories on aircraft under 199 seats until it becomes technically feasible to reconfigure cabin interiors at reasonable cost without removing revenue seats.

Regarding boarding equipment, disability groups stated that mechanical lifts should be required that technology exists to provide safe, dignified hoarding of disabled persons. and that such assistance should be required on all size aircraft. including lifting persons by hand if necessary, and if requested. The airline industry proposed exempting small aircraft from boarding requirements, stating that lifting devices to fit small aircraft do not exist, and strong opposition to hand-carrying passengers.

These comments contained little, if any, new data on the costs, number of revenue seats requiting displacement. and other advantages and disadvantages of alternative approaches to meet accessible lavatory and boarding assistance requirements. The Department does not have sufficient data of its own, at the present time. In the absence of such information. it would be premature to promulgate final regulations. Consequently. the Department decided to publish this ANPRM to acquire additional information needed to further implement the Air Carrier Access Act (ACAA).

Establishing a requirement for accessibility is consistent with DOT policy: the questions we have relate to technical feasibility and cost. With adequate information not forthcoming in the response to the NPRM of June 1988, and in light of the commercial aviation system not having developed such facilities. the Department feels it has the responsibility to lead a collaborative effort to achieve consensus regarding these accessibility features so needed by those with severe mobility impairments. It intends to begin this process through this ANPRM. Subsequently, the Department would convene a conference concerning all of these topics. We would intend to engage aircraft designers, lift designers. representatives of the disability groups, and the carriers, in an effort to find solutions which could provide a substantive basis for rulemaking in these areas. If necessary to provide information or develop facilities, the Department would also commit resources to a research contract or project for these purposes.

The Department requests technical and economic information to complete its rule in the following areas:

A. *Boarding* Assistance *on Small Airplanes-The* situation is very unclear *on* the present state-of-the-art technology in lift devices and boarding chairs being used by operators of small aircraft (below 30 seats) to assist *in* boarding and deboarding persons with limited mobility. With respect to such devices. the Department seeks comments concerning their practicality. the safety of the disabled passengers and the crew trying to assist their boarding/deboarding, and the capital. operating and maintenance costs.

A long-standing but nevertheless urgent problem is the need *for* a device that will facilitate the boarding and deboarding of many regional and commuter aircraft by persons with mobility impairments. Almost all such aircraft board from the tarmac and passengers with severe mobility impairments sometimes are hand-carried up and down narrow stairs built into the aircraft door, which have weight limitations.

Hand-caving a person up stairs is dangerous and often can cause physical stress and potential injury both to the passenger and to carrier or airport personnel. Further. many operators of small aircraft have few personnel at some terminals. necessitating special advance planning to accommodate persons with severe mobility limitations. For these reasons. the final ACAA rule does not require hand-carrying.

Code sharing arrangements between major carriers and regional and commuter carriers has been increasing the tendency for persons with severe disabilities to travel on small aircraft. Adding to the difficulties for small carrier8 are stringent schedule8 which often require short rum-around timer. Some carriers hand carry passengers on and off planes because it is the quickest way to load them and avoid flight delays.

A related problem is the need for a "boarding chair", specifically designed to fit narrow cabin spacer. that can maneuver their narrow aisles. Carriers claim that two personnel are needed to lift passengers who an completely physically immobile from boarding chain to a cabin seat.

The Department desirer to assure the widespread availability of mechanical lift devices and the regional airline industry has made a concerted effort to have such devices developed. Eventually, DOT hopes to be able to facilitate their we through rulemaking. but it cannot do so yet without definitive data on the availability and workability of existing devices. If a suitable device does not exist. the Department will encourage the development *of* such devices capable of lifting passengers from ground level to the aircraft door and visa versa. These vertical conveyance devices should be developed and put into service at the earliest possible date.

In 1987, $250,000 was provided by the Congress lo the FM to foster the development of a lifting device that would provide improved access by handicapped persons to commercial aircraft. The *FM* formed a working group consisting of the paralyzed Veteran8 of America, the Regional Airline Association, and the American Association of Airport Executive8 to consider how best to utilize these funds. Bared on their deliberations. the FM bar issued a solicitation to develop a boarding chair to fit cabin dimensions of ten different small plane:.

Concurrently, this working group is considering the alternatives regarding vertical conveyance devices. This work has not advanced to the point where there could be certainty in imposing a particular ret of requirements through rulemaking.

The Department also is aware that Mid-Canada Equipment Saks. Ltd., has built a prototype lift device which has been tested successfully with a DeHavilland Dash 8 aircraft. Mid-Canada has completed five devices that will be evaluated by five regional carriers. The present design, however, is not compatible with at least two modek *of* aircraft currently in service.

From the comments received in response to the NPRM, the Department is not aware of any other efforts to build a device intended to assist persona with mobility limitations to board and - deboard small ● i&zaft. .

With respect to lifting devices the Department seeks comments concerning:

. The names and addresses *of* manufacturers;

• The names and addresses *of* carriers who have or are currently using such devices;

• Type8 of aircraft served;

• Dimensions:

• principle of operation;

• Transportability;

• Maneuverability:

• Stability:

• Source of power (e.g., on board, electrical. etc.);

• Costs of acquisition and operation:

• General characteristics such as lift platforms, controls and safety features; and

• [illegible] experience.

B. *Accessible Lavatories*—The ability to provide lavatory • cc%u varies widely with regard to individual aircraft interior cabin designs. A rule that lavatories must be fully or partially accessible could require substantial loss of revenue seats due to the present constraints in the configuration8 of some aircraft cabins. While the final rule implementing the ACAA will require such lavatories *for* wide-body airplanes, on the premise that most are of sufficient size that such special arrangements can be accommodated, narrowbody (e.g., 727,737, DC-9 and smaller airplanes) would require major design changes in the lavatory and adjacent area, and in some cases, galley relocation. to provide reasonable access and privacy. The Department seeks comment concerning lavatory design pouibilitier and associated costs on all such aircraft models which would allow accessible lavatory objective8 to be met without loss *of* seats, or minimal loss of seats, and would not jeopardize safety.

The NPRM for the ACM final rule addressed accessibility of aircraft lavatories at two levels. The fully accessible level, proposed for larger aircraft, considered a lavatory with specific accessible hardware features and large enough to permit a person using an on-board chair to enter. maneuver, transfer and leave. A second partially accessible level lavatory. with the same accessible hardware was proposed for smaller planes. Such lavatories would not require full entrance by passengers using the on-board wheel chair. nor would the means of privacy have to be equivalent IO that of other persons.

The June 1988 NPRM sought comment on how the disabled user's privacy can best be protected. What features could be implemented at reasonable cost? Could a curtain or screen arrangement provide adequate privacy? Could a door or privacy curtain be installed without causing seats to be removed. especially in smaller aircraft? Could there be space to allow a wheelchair to maneuver at the door and allow a person to enter the lavatory without causing the removal of seats, especially on smaller aircraft? What lead time would be needed to allow for the technical development of an adequate facility? If a facility could not be developed to meet there requirements would a lesser degree of privacy be acceptable (e.g., a privacy curtain over the door)?

Based on the comments received. there was little agreement on what degree of accessibility was possible on narrowbody planer. The Department has determined that this is a complex question tied more to specific aircraft type than to aircraft size categories which could not be answered with sufficient certainty for rulemaking. What is needed is additional technical and economic information focusing on these issuer from those who design the interiors of airplanes, the disabled individual8 who would use these facilities, and the air carriers to whom this will be one more added feature to be included as part of their service to the disabled community a broad segment of the public.

Narrowbody Aircraft (100–199 seats)—Clearly it is possible to require a fully or partially ● ccesrible lavatory in narrowbody planer but only at the high costs *of* roughly 3 to 6 lost revenue seats and considerable inconvenience for other passengers. The Department estimates the cost for such requirements would range from $80 to $200 million annually by the year 2000.

Some have suggested an accessible lavatory could be provided on narrowbody aircraft by combining two adjacent lavatories or 2 cross-aisle lavatories. This raiser question8 as lo what inconvenience would result to other passengers, with aisles and lavatories blocked off, and/or aisles occupied by beverage carts. Passenger traffic through the galley areas and the ability of the flight crew to perform necessary functions in the galley are also concerns. Taking away galley space to free space for accessible lavatories also presents service nroblems for other

passengers. Thus. there remain major questions as to what such arrangements would do to traffic flows through the fuselage. and how such altered traffic patterns would impair safety and interfere with flight crew functions.

Small Aircraft (10–100 seats)—The airline industry, the Boeing Company and General Aviation Manufacturers Association (GAMA) representatives assessed the existing *cabin* space and lavatory apace in current 50–100 seat aircraft as being very tight: no room to disrobe. *no* room for au attendant. and the toilet is opposite the door in most cases requiring a person in an cm-board chair to execute a 180 degree turn to transfer to the toilet seat. In their opinion. there is no available room in some present aircraft configurations to create a privacy area outside the lavatory without the possible removal of one to three revenue seat per aircraft.

GAMA was not firm on the seat loss estimate pointing out that the problem will differ by manufacturer. depending on the aircraft configuration. Their representative speculated en a number of possible ways to meet the NPRM requirements which might avoid loss of seats. For example. most lavatories on such aircraft art? located at the farthest point in the rear cabin where people can stand up. and It might be possible in some configurations to hook up a curtain across the aisle in front of the lavatory and create a privacy area, providing a galley is not located in the rear.

Newly manufactured aircraft of current certificated type designs with both the lavatory and galley located in the rear cabin (more than 50% of aircraft have this configuration) might be redesigned to create a *privacy* area by relocating the galley up front in the cabin where a coat closet presently exists in most models. GAMA cited many potential problems associated with this option e.g., the galley may not be able to fit in the coat closet or other space up front in the cabin without seat removal: many galleys are built directly into the aircraft and manufacturers must assure that the new galley would withstand bearing load in a crash situation. A very rough order of magnitude estimate *of* the average cost of galley relocation is $75,000 to $100,000 per lavatory. The cost of redesigning the BAE 146 model aircraft to relocate the galley in the front of the cabin was estimated at roughly $200,000 total coat *per* aircraft. GAMA doer not foresee a reduction in these costs dw to future economies Of scale. because the total number of aircraft in this class to be replaced annually is too small to justify amortization of the costs. Thus, galley relocation would he expensive; probably as expensive as removing seats to create a privacy area.

The ATA cited alternatives for accessible lavatories including reconfiguration or removal of a galley which would entail extreme expense and constitute • dear undue financial burden

. For the purposes of this ANPRM, the Department solicits comment *on* the following questions:

• For the various cabin configurations of different aircraft types (under 200 seats), what physical layouts are possible to offer passengers at least visual privacy, and the ability to maneuver in the lavatories?

• What physical layouts are possible which would provide disabled passenger8 full-maneuvering room ruing the on-board chair inside the lavatory? What layouts would provide partial accessibility, meaning *a* privacy area/ curtain outride the lavatory?

• Which designs can be accomplished without the loss of revenue seats? Which design can be accomplished with only a minimal loss *of* revenue seats?

• How would such arrangements impact on the passenger traffic within the cabin, flight attendant duties in galleys, and the opportunity for passengers to use other lavatories?

• How might such arrangements impair safety?

• [illegible] chain be stored?

• [illegible] to [illegible] size airplanes *and* what types ma such requirements reasonably be imposed?

• Should the requirements for accessible lavatories be made *a* function of stage length (i.e., the length of the flight which the aircraft performs) instead of airplane size, and if so *for* what stage lengths should such requirements be imposed?

C. Additional Accommodations for Hearing Impaired Persons—In the comments to the *ACM* rulemaking docket, commenters asked *for* some additional accommodations for persons with hearing impairments. Because the Department is unsure of the technical or economic feasibility of these suggestions, we felt it was not appropriate to dispose of them in the final rule.

The first wad for captioning of in-flight movies. Many hearing impaired persons could not fully enjoy in-flight movie, because they could not hear the round track on the headphones. Captioning movies would ● l&viate this problem. The Department seeks comment on the cost and feasibility of captioning movies. The Department also seeks comment on the indirect economic impact of doing so (i.e., if movies were captioned. many persons in addition to those with hearing impairments would be able to more fully *enjoy* movies without renting a headset, which could adversely affect headset revenue).

The second suggestion was for providing telecommunications devices for the deaf (TDDs) in on-board phone banks. This service is provided on some aircraft. Where it is. should there be TDD a8 well as voice phone service available? What cost and feasibility considerations are involved? What degree of usage of TDD service is it reasonable to expect?

Regulatory Process Matters

The discussion in his notice is not designed to resolve matters of policy, but rather to determine how best to overcome technical and economic limitations constraining policy. This calls for a somewhat innovative procedure, different from standard rulemaking. Therefore, through this ANPRM, the Department is requesting comments on the above issues from *all* interested parties: disability groups, lift designers and manufacturers, airplane designers and manufacturers and air carriers within 90 days. The comments will be reviewed and. if necessary. the Department will publish summaries of the various viewpoints.

The Department anticipates a conference of these same interest groups to bring designers and users from the disabled community together for an exchange of information. If necessary, the Department would also engage a contractor to study one or more of the issues. After a review of the information we obtain, the Department will make *a* decision on taking additional regulatory action covering the areas of inquiry.

This ANPRM is not a major rule under Executive Order 12291. It is a significant rule under the Department's Regulatory Policies and Procedures. Because the document requests comments on feasibility and cost issues about *which* the Department currently has little information, the Department is not preparing a regulatory evaluation at this time. An evaluation would be prepared with respect to any future rulemaking resulting from this ANPRM. There are not any Federalism implications to this ANPRM, and a Federalism Assessment consequently has not been prepared. The Department will determine. a! a later time. whether there are any small entity impacts for whatever proposals derive from this notice. A Regulatory Flexibility Analysis would be premature

● [illegible]

Issued this 28th dry of February 1990. at Washington. DC.

Samuel K. Skinner,

Secretary of Transportation.

[FR Doc. 90–4995 Filed 3–2–90; 8:45 am]

BILLING CODE 4910-62-M

49 CFR Put 27

[Docket No. 46813; Notice 90-12]

RIN 2105-AB62

Nondiscrimination on the Basis of Handicap in Federally-Assisted Programs

AGENCY: Office *of the* Secretary. DOT.

ACTION: Notice of proposed rulemaking (NPRM).